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ABSTRACT

This paper is intended to function as both a major analytic effort and a review of the literature relevant to the establishment of an occupational information system. An introduction is followed by a summary of the legislative history documenting the process by which occupational information has been increasingly recognized as an essential element in the policymaking agenda. Section 3 outlines the conceptual foundations underpinning the use of occupational information. The section includes a discussion of alternative theories of the labor market, interventions that are appropriate in a theoretical context, and the data elements required to implement and monitor such interventions knowledgeably. Theories of vocational decisionmaking are discussed, and an attempt is made to place the need for labor market and occupational data in the context of vocational choice. Section 4 discusses the uses of occupational information for planners and guidance personnel. Anticipated and known benefits of data use in the decisionmaking processes of these user groups are addressed. The fifth section is devoted to the identification of specific data elements necessary in an ideal occupational information system. A conclusion and a bibliography end the paper. Appendixes are author recommendations for data elements for an occupational information system and an annotated bibliography. (YLB)

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DATA NEEDS AND USES IN THE CONTEXT OF AN OCCUPATIONAL INFORMATION SYSTEM: A REVIEW OF THE LITERATURE

by

Nancy Ann Paulson

Prepared for

North Carolina State Occupational Information Coordinating Committee

and

National Occupational Information Coordinating Committee

Research Triangle Institute
North Carolina

March 1981

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ABOUT NOICC

The National Occupational Information Coordinating Committee (NOICC) and its counterpart State Occupational Information Coordinating Committees (SOICCs) were created by the Education Amendments of 1976 (Public Law 94-482) with a mandate to:

- Development and implement a national, State and local occupational information system to meet the common occupational information needs of vocational education and employment and training program adminstrators and planners, and

- Improve coordination between, and communication among, such administrators and planners, as well as employment security agency administrators, research personnel and others.

The Comprehensive Employment and Training Act (CETA) Amendments of 1978 (Public Law 95-524) call for NOICC to:

- give special attention to the labor market information needs of youth.

The following officials are named in the 1976 law as members of NOICC:

- Commissioner of Education[1],

- Administrator of the National Center for Education Statistics,

- Assistant Secretary for Employment and Training, and

- Commissioner of Labor Statistics.

The members of each SOICC, also specified in the law, are representatives of:

- the State Board administering vocational education,

- the State employment security agency,

- the State employment and training council, and

- the State agency administering the vocational rehabilitation program.

1/ The function of the U.S. Office of Education was moved to the U.S. Department of Education subsequent to the 1976 law.

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ACKNOWLEDGEMENTS

This report is one of several products of the National Occupational Information Coordinating Committee (NOICC) produced under a grant for "Assistance in Occupational Information System Development and Implementation." This grant was awarded in 1979 to a consortium of the State occupational information coordinating committees (SOICCs) of North Carolina, South Carolina and Colorado.

The grant called for the accomplishment of four major tasks:

Task 1. Preparation of a national overview of the need for occupational information through a review of the literature, a summary of State needs assessment studies, interviews with Federal agency staff, and preparation of concept papers by recognized experts in the fields of vocational education, career counselling, CETA program planning, employment service operations and vocational rehabilitation. Reports from Task 1, including this report, are listed on p. iii.

Task 2. Development of an Occupational Information System (OIS) Handbook. This task has resulted in a three volume Handbook:

Volume 1. Occupational Information Development

Volume 2. Occupational Information Analysis, Presentation and Delivery

Volume 3. Technical Addendum

An OIS Handbook Executive Summary has been prepared as well.

Task 3. Development of training materials to accompany the OIS Handbook. The training materials include over 100 pieces of art work suitable for making overhead slides and a trainer's guide designed for use by Federal and State personnel to introduce audiences to the NOICC/SOICC network and the occupational information system.

Task 4. A training conference to introduce the OIS Handbook. Such a conference for States and territories in Federal regions I-5 was held January 6-9, 1981, in Raleigh, North Carolina, and for those in Regions 6-10, January 27-30, 1981, in San Antonio, Texas. Participants in the conferences included representatives of the Federal and State agencies which are members of NOICC and SOICCs, and staff of the SOICCs.

Task I was carried out by Research Triangle Institute, Research Triangle Park, North Carolina. Dr. John E.S. Lawrence and Dr. Alvin M. Cruze served as project managers and authored some of the reports. Tasks 2 and 3 were performed by Program Resources, Incorporated, of Rockville, Maryland. David S. Lipstein, PRI Vice President, served as project director; Harvey Ollis was principal investigator. Task 4 was carried out jointly by RTI and PRI.

Joyce F. Kinnison, Director of the North Carolina SOICC, and Geroge E. Probst, Director of Research for the North Carolina SOICC, served as overall managers of the grant. Carol Kososki, Director of the South Carolina SOICC, and Warren W. Wolff, Director of the Colorado SOICC, provided valuable input and served as reviewers for the project.

Dixie Sommers of the NOICC staff was responsible for monitoring and overseeing the grant, under the supervision of Richard E. Dempsey. Russell B. Flanders, Executive Director of NOICC, provided general direction.

This report, one of the products of Task I, reviews the literature in the areas of education and training policy and planning, and career counselling, to identify existing discussion of the use of occupational information. The report was prepared by Nancy Ann Paulson, formerly economist with the Center for the Study of Social Behavior, Research Triangle Institute.

Reports on the Need for Occupational Information

Concepts Papers

Occupational Information System and the Employment Security System: A Need and Resources Assessment, Charles E. O'Dell, 1980.

Occupational Information and Vocational Education: A Concept Paper, Donald W. Drewes and Gary R. Bice, 1980.

The Role of an Occupational Informatin System in Career Guidance and Counselling, Edwin L. Herr, 1980.

Occupational Information Needs for CETA Prime Sponsor Policy Making, Planning, and Program Operations, Andrew M. Sum and Paul E. Harrington, 1980.

Occupational Information System and Vocational Rehabilitation: A Concept Paper, Joseph B. Moriarty, 1981.

Literature Review

Data needs and uses of the Context of an Occupational Information System: A Review of the Literature, Nancy Paulson, 1980.

State Needs Assessment

Occupational Information Needs at the State Level: An Empirical Study of Data Needs Assessment Surveys, John E.S Lawrence and John Gross, 1980.

Federal Interviews

Occupational Information Needs at the Federal Level, John E.S. Lawrence and Alvin M. Cruze, 1981.

Final Report

Occupational Information Needs in Selected Public Agencies at the State and National Levels, John E.S. Lawrence, 1981.

Copies of Reports are available from NOICC
2100 M Street, N.W., Suite 714, Washington, D.C. 20037

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Data Needs and Uses In the Context of an Occupational Information System: A Review of the Literature

I. INTRODUCTION

In recent decades there has been a growing recognition of the need for timely and reliable information on the conditions of occupational employment at both the local and national levels. A primary use of occupational information is in the development of appropriate labor market policies. The implementation of these policies in a consistent manner depends on the development of a variety of supporting education and employment and training programs. Effective program planning in the fields of education, vocational skill training, and employment also necessitates data on the conditions of employment at the local and national levels.

The need for occupational information across a broad array of policymakers, program planners, and other kinds of labor market intermediaries has stimulated an interest in systematizing the wealth of data that is currently available. Such a system is intended to improve access to quality information among all individuals who rely on data about the labor market to make decisions, from government officials developing a national employment and training policy to adolescents making preliminary vocational choices. Determined efforts have been made at establishing an occupational information system to aid in decision-making for these groups. The efforts were initiated at the state and local levels, where a handful of recommended blueprints for an information system were developed in the late 1960s and early 1970s. The 1976 legislative mandate for a National Occupational Information Coordinating Committee (NOICC), with its 57 state counterparts, ensured that national attention and resources would be turned to the development of an information system beneficial to individuals involved in a wide range of decision-making. In turn, the legislation has further stimulated interest in the conceptual basis and the necessary data elements of an occupational information system.

The occupational information system mandated in the 1976 Education Amendments was intended to benefit a range of people and to aid them in a variety of complex decisions. The initial incentive behind the use of occupational information resulted from programmatic concerns. In this regard Margaret Thal-Larsen (1972) stated that "few manpower or training activities can be carried on and few services can be performed in the absence of information about the labor market, and none of them should be." The need for data has accelerated as programs have become increasingly decategorized and decentralized. With this programmatic trend, more individuals are making decisions at different points in time, at different periods in the planning cycle, and with different purposes in mind. In addition, decisions are being made with special reference to particular geographic regions, and it is necessary to understand the condition of the local occupational employment in order to design the most effective intervention strategy. In other words, decisionmakers at all levels of government are requiring increasing amounts of occupational information to improve the quality of their decisions (Drewes and Katz, 1975; Lecht, 1977; Mangum, 1978). Similarly, the high youth unemployment rates of the 1970s have highlighted the need for an improved vocational decisionmaking process for individuals (Wolfbein, 1975; Parnes and Kohen, 1975; Andrisani, 1978). The foundation of improved decisionmaking is assumed to rest on increased knowledge of appropriate vocational opportunities and greater access to information for individuals making vocational choices.

Information about labor markets and occupations has a wide variety of uses and users. A recent National Occupational Information Coordinating Committee document identified the three major groups of occupational information as planners and administrators, labor market intermediaries, and direct participants in the labor market (NOICC, 1979). Planners and administrators - including vocational education planners and administrators, CETA planners and administrators, economic development planners, managers of human resource development programs, and policy decisionmakers - use occupational information primarily for program planning and policy decisions. As labor market intermediaries, teachers, vocational counselors, guidance counselors, job placement

specialists and Employment Service personnel require occupational information for counseling, job placement, and course development. A wide variety of direct participants in the labor market use occupational information for job search activities and career decisionmaking. Individuals who use occupational information for these activities include youth, secondary and post-secondary students, the unemployed, the incarcerated, new entrants and reentrants to the job market, individuals who need information about career choices, military returnees, and employers. Because the prime function of guidance personnel is to utilize occupational information to benefit directly the participants in the labor market and because these intermediaries work closely with the labor market participants in utilizing occupational information in vocational decisionmaking, the two user groups will be discussed together for the remainder of this paper.

In this paper the literature relevant to the establishment of an occupational information system is reviewed. The ultimate purpose of the literature review is to identify data elements to be included in an occupational information system. In identifying data elements, particular attention was paid to the data needs of two potential user groups. The first major user group, planners and administrators, use occupational information primarily to support the planning process for vocational education and other training programs. The second major user group, guidance personnel and direct participants in the labor market, use occupational information primarily to support career planning, guidance, and job search needs. The data needs of these two groups overlap heavily, although the purpose for which they may use any given piece of data may differ.

Indeed, data needs are dependent upon the use to which the data will be put and the activities of individuals who will be using the data; specific data elements become more or less important depending on the perspective of the user. To place these data needs in context, it was necessary to discuss the conceptual basis of the labor market, the alternative theories which offer explanations for its operation, and the place of the individual within the labor market. The adoption of a theoretical framework of the labor market limits the concepts which one

is interested in measuring and manipulating. This, in turn, will help define the data which the labor market intermediary will need to make an informed decision. The relationship between theory and data needs is drawn carefully in this paper. The paper is intended to function as a major analytic effort, as weil as a review of the literature.

The organization of the paper is intended to highlight its dual purpose. The section which follows summarizes the legislative history, documenting the process by which occupational information has been increasingly recognized as an essential element in the policymaking agenda. In the third section the conceptual foundations underpinning the use of occupation information are outlined. The section includes a discussion of alternative theories of the labor market, interventions which are appropriate in a theoretical context, and the data elements required to implement and monitor such interventions knowledgeably. Theories of vocational decisionmaking are also discussed, and an attempt is made to place the need for labor market and occupational data in the context of vocational choice. In the fourth section the uses of occupational information to planners and guidance personnel are discussed in greater detail. Anticipated and known benefits of the use of data in the decisionmaking processes of these user groups are discussed as well. With an understanding of the uses of occupational information, it is possible to identify the actual data elements which are necessary in an ideal occupational information system. The fifth section is devoted to the identification of specific data elements and conclusions are drawn in the final section.

II. LEGISLATIVE HISTORY OF THE NEED FOR OCCUPATIONAL INFORMATION

A. Overview

An implicit recognition of the need for occupational information has been evident in employment-related legislation for over four decades. In 1933 the Wagner-Peyser Act established the public employment service to help job seekers find suitable employment. An additional contribution of the Wagner-Peyser Act was the provision of funds for the first edition of the Dictionary of Occupational Titles. This comprehensive occupational classification system has recently undergone revision and is still used as the occupational classification scheme for jobs registered with the Employment Security system. Like the Wagner-Peyser Act, the Employment Act of 1946 developed out of a concern for matching people and jobs to ensure the maximum utilization of the nation's labor resources. Neither piece of legislation explicitly called for the use of occupational information to aid job seekers in the choice of an occupation which was optimally suited to their skill level and job needs. However, it is clear that program planners, guidance personnel, and job seekers alike require knowledge of the skills of the available pool of labor and the skills necessary to perform a given job to help the individual make the most informed occupational decision.

The decade of the 1960s brought rapid changes in education and employment and training policy. As with most areas of national social policy, these policies became significantly more aggressive throughout the first half of the decade. The need for labor market information to plan, implement, and monitor the policies was recognized by Congress. In their discussion of the changing legislative stance toward labor market information, Yavitz and Morse (1973) identified three forces behind Congress' increased emphasis on information needs. At the most basic level, the computer revolution made it possible to process and disseminate vast amounts of information on a timely basis. Second, a growing awareness of the costs involved in unemployment and underemployment underlined the importance of monitoring changes in these social indicators. And, third, as national policy became more aggressive, Congress wanted to play a more active role in appropriating and con-

trolling expenditures. Armed with extensive information about labor market conditions and the effects of employment and training programs on these conditions, Congress would be in a strengthened position to exert control (Yavitz and Morse, 1973). This strategic control function took on added importance as employment and training policy was targeted to specific population groups. Although these policies began with an emphasis on institutional intervention into the labor market, through the 1970s the scope of employment and training policy expanded to include assistance to the individual in finding a place in the labor market. A history of the legislation responsible for these changes is described in a New England Regional Commission-funded study by the U.S. Department of Labor (1978) and in a paper by Christine LeCam at the Massachusetts Department of Manpower Development (1979). The remainder of this section draws heavily on these two documents.

B. Legislative History

1. Area Redevelopment Act

The Area Redevelopment Act of 1961 (ARA) was the first piece of legislation implicitly requiring information on both the supply and demand of labor in the planning of manpower programs. The law consisted of four major provisions. The first three provisions provided incentives to employers to locate and expand their firms in economically depressed regions. The fourth provision was intended to insure that a skilled labor force was available to fill the newly created jobs. As pointed out by the U.S. Department of Labor report, two distinct pieces of labor market information were needed to fulfill the intent of the legislation. First, it was necessary to identify the skill needs of the locating firms. It was subsequently necessary to assess the job skills of the available labor pool. With these two sets of information it is possible to match workers to appropriate jobs.

Although the ARA was small in scope, it was an important piece of legislation. The strategy of ameliorating bottlenecks in the labor market through skill training, as well as the tactic of targeting training to geographic areas on the basis of established criteria were unique approaches in 1961. And the role the legislation assigned, albeit implicit, to labor market information in program planning was of fundamental importance. These three strategies would consistently reappear in future employment and training legislation.

2. Manpower Development and Training Act

In addition to reaching a larger target population, the Manpower Development and Training Act of 1962 (MDTA) differed from the ARA in the approach to problem-solving in the labor market. The ARA had focused directly on facilitating industrial expansion in specific geographic areas. Consistent with this approach, skill training was a strategy adopted to aid an ailing labor market. On the other hand, any geographic area was eligible for MDTA funds. More significantly, industrial expansion was not dealt with directly under MDTA; it was assumed to be a function of macroeconomic policy. Under MDTA, skill training was intended primarily to benefit the unemployed worker, and the condition of the labor market was not dealt with as a distinct issue.

However, like the Area Redevelopment Act, MDTA continued to emphasize the importance of labor market information in the development of labor market policy and its supporting programs. If the intent of the law was to be fulfilled, MDTA required the dissemination and use of occupational information. The legislation called explicitly for a system to provide information regarding skill requirements, occupational outlook, job opportunities, labor supply, and employment trends. Recognition was also given to the need for occupational information on a subnational basis. In partial response to this mandate, a variety of data collection programs were initiated through the 1960s, including the employment service area reporting system (ESARS), the occupational employment statistics program (OES), the occupational employment projections program, the now discontinued job openings and labor turnover systems (JOLTS), and the employment, hours, and earnings survey (LeCam, 1979).

3. Vocational Education Act

The Vocational Education Act of 1963 was the first piece of legislation requiring labor market information in educational planning. Since 1917 the vocational education system had been charged with the use of available Federal funds to prepare individuals for gainful employment. In 1961, a commission had been appointed to study the condition and effects of vocational education. This commission found that the vocational education system did not respond to changes in the local labor market and that the training system did not meet the needs of segments

of the population. In response to these findings, the 1963 legislation required the vocational education system to meet the needs of the entire community through unified programs, rather than through training in a selected group of occupations. In addition, emphasis was to be given to the needs of those who were at a disadvantage in the vocational education system. Statewide attempts to conform to the intention of the legislation were to be documented in state plans. Among other things, these plans were required to provide information regarding the area labor market. States were further required to form cooperative arrangements with employment security offices for obtaining the necessary occupational information. However, according to LeCam (1979), the resource contraints under which employment security offices operated limited the occupations information which they were able to provide to the state vocational education systems.

4. Vocational Education Amendments

The intent of the 1963 legislation was reemphasized in the 1968 Vocational Education Amendments. The 1968 Amendments established the National Advisory Committee on Vocational Education, as well as the state counterparts, the District of Columbia, and the territories.

The purpose of the Councils were to monitor and evaluate vocational education at the state and national level. In response to criticism that vocational education was insensitive to changes in the labor market, the 1968 Amendments also eliminated the categorical funding of state vocational education programs. However, Federal grant-in-aid funds were distributed to selected states to ensure that national vocational education priorities were met in all the states. In addition, segments of the population which were felt to be at a disadvantage in the vocational education system were delineated more closely. These targeted segments were termed "handicapped" and "disadvantaged." Individuals characterized by physical or mental incapacities were to be called handicapped; the term "disadvantaged" was reserved for individuals characterized by socioeconomic deprivations. The legislation required that all states establish programs for identifying the handicapped population. A final important aspect of the 1968 Amendments was the requirement that state

plans be updated annually. As it had since 1917, the legislation continued to urge that training be realistic in light of actual or anticipated openings for gainful employment. Efforts in this direction were to be documented by a long-range state plan.

5. Comprehensive Employment and Training Act

The Comprehensive Employment and Training Act of 1973 marked two significant departures from previous employment and training legislation. First, CETA legislation is significantly more comprehensive in the approach to employment and training problems than either ARA or MDTA. Second, consistent with the Nixon Administration thrust toward decentralization of Federal programs, CETA decategorized employment and training programs and placed responsibility for their control with state and local officials. With CETA the strategy of the 1963 and 1968 vocational education legislation was adopted in the employment and training context. That is, an annual employment and training plan was required to "provide assurances that programs of institutional training be designed for occupations in which skill shortages exist and assurances that such programs and training on the job shall, wherever possible, result in employment which provides economic self-sufficiency." Such a legislative mandate clearly necessitates the use of occupational data in program planning. In fact, the legislation contained two provisions relating specifically to the provision of labor market information. To help ensure the availability of needed data, the Secretary of Labor was called on to develop a comprehensive system of labor market information "on a national, state, and local or other appropriate basis, which shall be made publicly available in a timely fashion." In a separate section of the legislation, prime sponsors responsible for delivering CETA services were authorized to use CETA funds to develop labor market information for their own use.

6. Education Amendments of 1976

The Education Amendments of 1976 solidified the Congressional mandate for the use of occupational information in education and employment and training planning. The explicit nature of the mandate follows from Congressional response to a 1974 Government Accounting Office report, What Is the Role of Federal Assistance for Vocational Education?,

and the 1975 Drewes and Katz study which concluded that labor market information was not adequately used in program planning and that the state plan was no more than a compliance document.

The Education Amendments brought several sweeping changes to the vocational education planning process. They changed both the extent of the planning and the actors involved in it, mandating program and administrative linkages between vocational education and CETA. The legislation solidified the planning process by requiring an annual update of a five-year plan. In this long-range plan the state agencies were required to assess current and future needs for job skills, using current and projected occupational employment. The vocational education planners were further required to justify the need for training in which program funding was requested.

In addition, the legislation mandated that evaluation become part of the planning process. Data used in program evaluation was to be contained in a national vocational education reporting and accounting system (VEDS). The Commissioner of Education and the Administrator of the National Center for Education Statistics were charged with developing data elements and uniform definitions of the elements slated for inclusion in the system. As a comprehensive data system, VEDS contains information on students, programs, program completers and leavers, staff, facilities and expenditures.

To facilitate the provision and coordination of this and additional occupational information a National Occupational Information Coordinating Committee with a system of state counterparts was established. The NOICC was charged with developing a plan for an occupational information system capable of serving the common needs of both the vocational education and CETA communities.

7. Youth Employment and Demonstration Projects Act

In 1977, the role of occupational information was further expanded in the Youth Employment and Demonstration Projects Act (YEDPA). This legislation provided NOICC with additional funding to serve still a new constituency, unemployed youth. To fulfill this mandate, NOICC turned its attention to serving the needs of local education agencies, post-secondary educational institutions, and the students themselves, in

addition to the vocational education and employment community. In particular, YEDPA directed NOICC to provide "technical assistance for programs of computer on-line terminals and other facilities to utilize and implement occupational and career outlook information and projections supplied by the state employment services offices and to improve the match of youth career desires with available and anticipated labor demand." With the reauthorization of CETA, YEDPA was incorporated into the 1978 legislation as Title IV.

8. Career Education Incentive Act

In this legislation the Commissioner of Education was charged with working with NOICC to examine the occupational information needs of local education agencies, institutions of postsecondary education, and students at both secondary and postsecondary institutions. The Act also instructs the Commissioner of Education to "furnish information to interested parties on Federal programs which gather, analyze and disseminate occupational and career information." Although the target groups which the Career Education Incentive Act requires NOICC to serve broadens the scope of the information requirements and user base which an occupational information system must serve, the analysis and dissemination of occupational and career information are consistent with the overall purpose of an information system (NOICC, 1979).

9. CETA Reauthorization

The 1978 reauthorization of CETA continued to delineate the wide-ranging responsibilities of planners and adminsitrators for the use of occupational information. In this legislation the Secretary of Labor was again mandated to develop a comprehensive labor market information system for national, state, and local decisionmakers. The Secretary was further charged with developing procedures for the uniform reporting by prime sponsors of enrollments, completions, and placements by detailed occupational or training codes. This provision marked the first time that prime sponsors were required to report enrollments and completions in skills training programs by occupation. Finally, the legislation increased the responsibilities of NOICC to examine the usefulness of occupational information for the youth vocational choice process.

10. Summary

This brief legislative history reveals major changes in the role of occupational information in the policymaking context. First, the Congressional recognition of the need for occupational information has moved from an implicit and indirect referral to an explicit demand. As the demand for the use of occupational information in program planning increased, Congress also began to delineate the categories of data elements which should be used in the decisionmaking process. Third, the mandate for the use of occupational information in decisionmaking was coupled with the mandate for the use of information to gain greater control over the management and accountability functions in program administration. Finally, the constituency to which occupational information is directed has expanded from planners and administrators in the employment and training and vocational education fields to individuals making choices about their own role in the labor market.

III. THEORETICAL BASIS OF AN OCCUPATIONAL INFORMATION SYSTEM

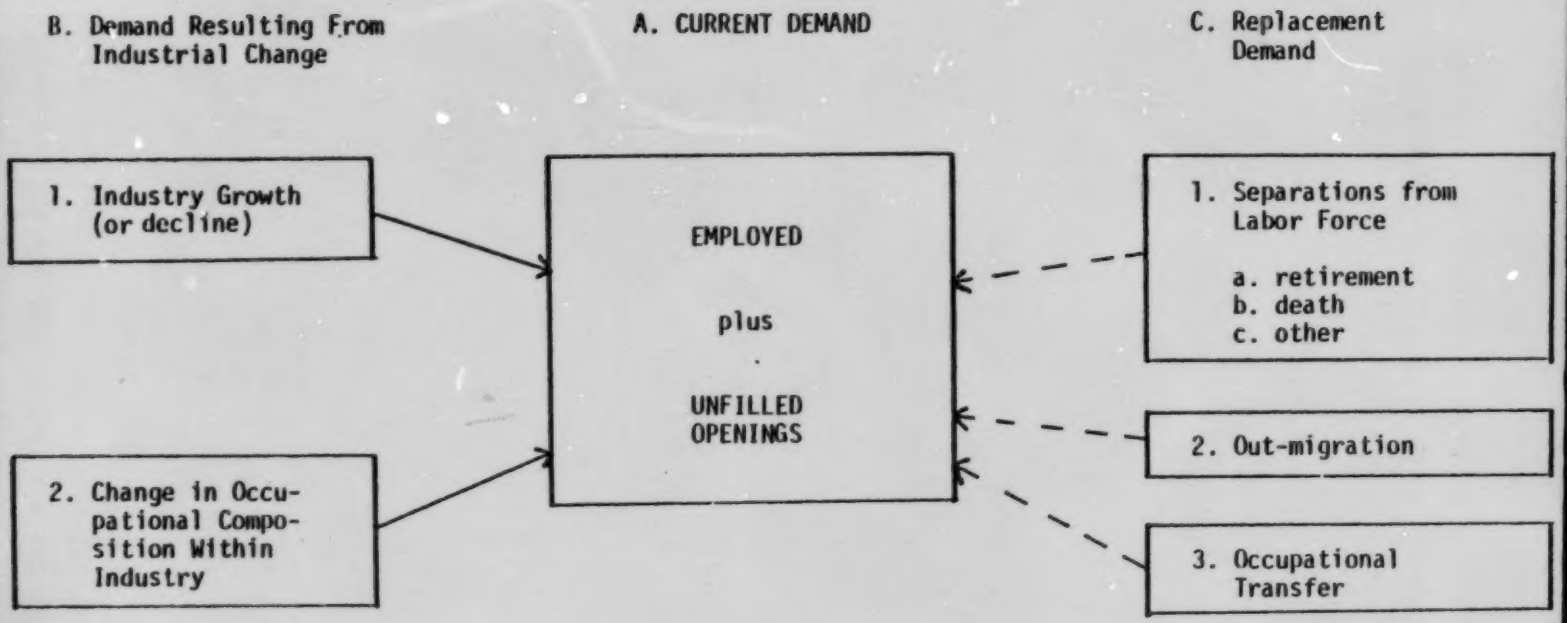
A. Conceptual Basis of the Labor Markets

The development of an occupational information system requires decisions regarding data elements to be included as well as the structure of those elements. In large part, these decisions are derived from the conceptual framework which is used to describe the labor market. Constructs have been developed to represent components of each of the important labor market concepts. In turn, these constructs can be measured empirically. The variables used to measure the constructs are what is commonly termed occupational information. The labor market, as understood by economic theory, is composed of two major concepts: occupational supply and occupational demand.

As indicated in figure 1, occupational demand is divided into three components. The first component, current demand, represents the filled and unfilled stock of jobs in a particular occupation. The second component, demand resulting from industrial change, represents changes due either to industrial growth or decline or to changes in the occupational composition of existing industries. The third component, replacement demand, differs from demand resulting from industrial change in that it does not cause a change in the size of the stock of jobs. Replacement demand is the number of workers in an occupation who must be hired to fill the current jobs of workers moving to other jobs, other geographic locations, or separating from the labor force (New England Regional Commission, 1978). In essence, occupational demand describes a flow of jobs.

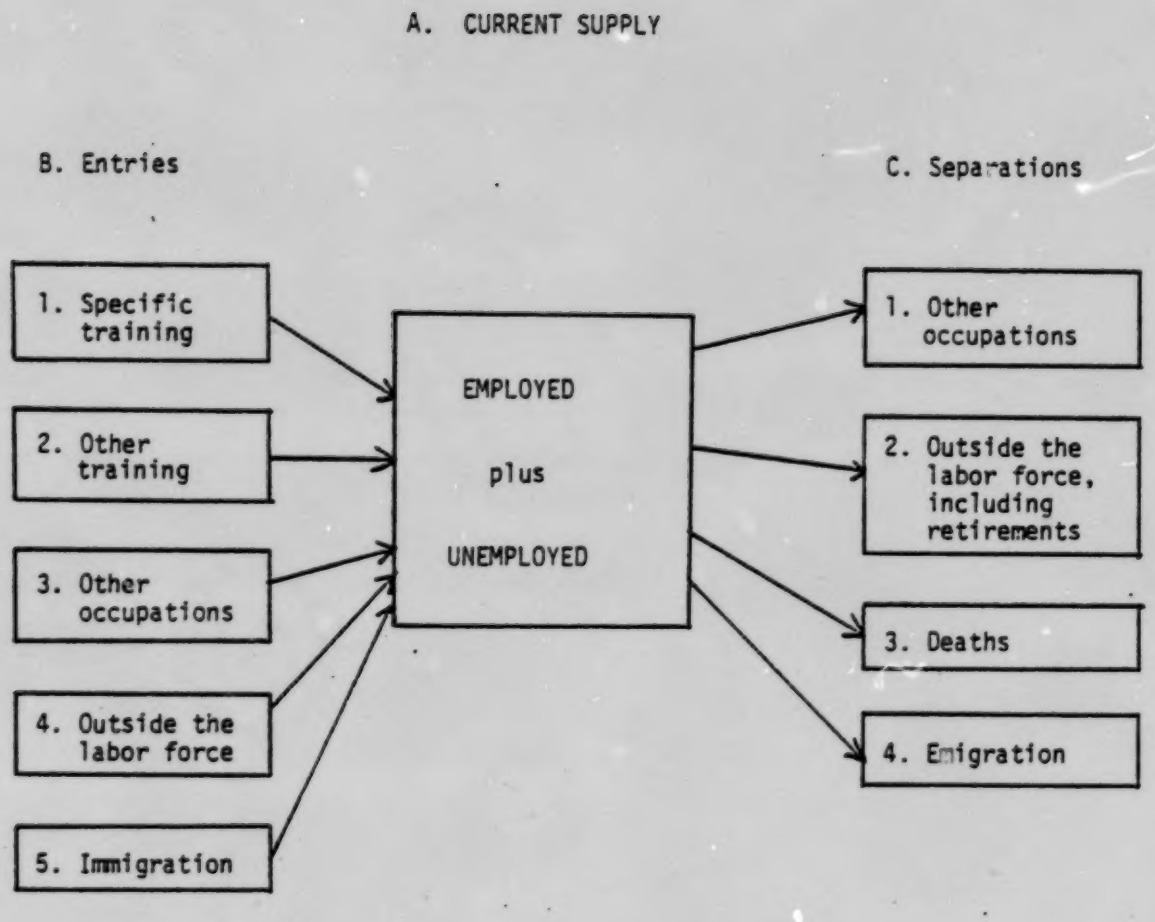
On the other hand, occupational supply is a more complex concept, describing a flow of workers in a given occupation. This complexity, captured in figure 2, results from the multiple sources of entry into and exit from an occupation. Figure 2 also indicates that occupational supply can be described with three major components: the current supply of workers in an occupation, the individual entries into the occupation, and the individual separations from it.

Ideally, occupational supply and occupational demand function as complementary to one another, so that the desired number of appropriately



Source: U.S. Department of Labor, Bureau of Labor Statistics, 1978.

FIGURE 1. Occupational Demand



Source: U.S. Department of Labor, Bureau of Labor Statistics, Bulletin 1816, 1974.

FIGURE 2. Occupational Supply

trained individuals work in any given occupation. There are neither too many individuals looking for work in the occupation nor too few appropriately trained individuals to fill the available job vacancies.

However, in reality, these two factors are not always coordinated to result in the full employment of workers. When an imbalance occurs, the market can adjust in a variety of ways. In an article on the techniques of manpower forecasting, David Stevens (1976) identified eight sources of market adjustment. Factors which influence the market on the demand side include: 1) relocation of the production site, 2) a change in the rate or mix of production occurring, 3) change in production technology, or 4) a change in occupational wages. Employers can have an additional influence on the demand side by increasing the number of exits from their firms through layoffs. On the supply side Stevens identified the following changes: 1) relocation of workers, 2) a change in investment in recruitment, 3) a change in the extent of on-the-job training, or 4) a change in the patterns of institutional training.

In the context of the conceptual model of the labor market, it is likely that one or more of the above changes would result in the desired intersection of occupational supply and demand. However, a major assumption underlying the conceptual model is the existence of the free market. Educational and employment and training planning are based on the premise that a free market does not, in fact, exist. A variety of "rigidities" or institutional constraints exist in the market which interfere with its free adjustment, and it is the purpose of educational and employment and training policies to overcome these institutional constraints and to contribute to labor market adjustments in spite of the constraints.

Ahamad and Blaug (1973) cite five major reasons for market rigidities. First, although it is possible for production sites or workers to relocate in the long term, these factors are characterized by limited mobility in the short run. Second, adjustments are also hampered by institutional controls, such as monopolies, on the one hand, or government regulations on the other. Third, rigidities in production technologies result in market rigidities. In the long run it is possible to change production technologies, but in the short run a change in the production process is not feasible. Therefore, it is not always possible to reorganize the

job to fit the pool of available workers. Fourth, on the supply side training periods are lengthy. If workers are not currently trained to work in any given occupation, the length of these training periods are likely to determine the time necessary for market adjustment. Finally, a free market is dependent on the flow of information. Without information about current conditions in the labor market, it is not possible for any individual or any firm to adjust to the situation with which they are faced. The individual does not have the information necessary to choose whether he is more likely to be employed as a brickmason or an electrical engineer and planners in an educational system do not have enough information to decide whether they should temporarily expand or contract an optician training program.

Government policies have been developed to help circumvent or overcome the rigidities in the market. Government economic policies primarily affect occupational demand, while education and employment and training policies have their primary effect on occupational supply (Yavitz and Morris, 1973). Education and manpower policies affect the flow of prospective employees into the labor market and into the array of occupations for which these potential workers can successfully bid. As has been implied above, the purpose of the policies is to improve the supply of workers such that the supply of potential workers will more closely match the sets of skills which employers will demand. The success of employment and training policy is dependent on the appropriate application of the employment and training requirements approach. This approach assumes that "there are identifiable requirements for labor services which can be derived from judgments about the structure of production and that can be translated into educational requirements, which can in turn be treated as targets for educational activities." (Stevens, 1976). Here it is important to link projected occupational skill requirements to the educational programs which train individuals in these skills and to complete that match by estimating the number of individuals with the appropriate skills who will actually seek employment in the occupations for which they are trained. Finally, the successful matching of workers and jobs is dependent on the success of labor market intermediaries in informing potential workers of possible job openings and the steps necessary to prepare for and obtain those jobs.

With increased knowledge of the labor market and the kinds of jobs potentially available, the individual has the opportunity to make a more informed career choice.

B. Labor Market Theories and Their Informational Components

1. Influence of Human Capital Theory on Data Needs

Since World War II, government educational and employment and training policies have been guided by the tenets of neo-classical economic theory. Neo-classical economic theory, of which human capital theory is a part, is rooted in the concepts of supply and demand. In the labor market the theory of demand is essentially a theory of marginal productivity. Under the assumption of perfect competition, the demand side of the market is said to function as a result of the profit-maximizing decisions of employers; employers' decisions are in turn based on their perceptions of the productivity of the workers whom they hire. That is, the employer will continue to hire workers until the point at which the marginal productivity of the last worker hired exactly matches the cost to the employer of operating the firm with that worker.

The supply side of the market, also under the assumption of perfect competition, operates in an analogous fashion. Workers, like employers, make optimizing decisions; however, what they optimize is their utility. To the extent a worker is able to quantify how much his leisure is worth to him, and similarly to have knowledge of how much his labor power is worth on the market, the worker will make a trade-off between work and leisure until he reaches the exact point at which his utility is maximized. This will be the point at which the marginal benefit of an additional unit of time spent in work equals the marginal reduction in utility from a unit of foregone leisure.

In economic theory, capital is thought to be anything which yields a flow of benefits over a number of time periods. The notion of human capital embodies the idea that the individual possesses some quality which will return to employee and employer a flow of benefits over a number of time periods. Within the context of the labor market this notion is both simplifying and unifying. That is, the employer demands what the worker supplies - human capital.

In the context of human capital theory, every individual has a store of "raw" human capital. In addition, the individual - just like a firm - can make investments to increase his store of capital. Schooling, and more recently, on-the-job training and experience, have become the most convenient and acceptable empirical indicators of the investments which an individual has made in his human capital. Similarly, the adequate performance of a job is thought to require an array of abilities and skills, requiring the job holder to have made specific human capital investments. In terms of the human capital model, an individual will be offered a job when his set of abilities and skills, obtained through human capital investments, match the skills required by a worker on a specific job. Across all individuals, the educational or employment and training planners ideally work to ensure the best possible match between the extent of human capital investment required on a job and the extent of human capital offered by the potential worker. Traditionally, the planner has worked to ensure this match by affecting the store of human capital of an individual. In this way, differences in individual investment behavior -i.e. investment in schooling, on-the-job training, and on-the-job experience - are thought to be the chief factors in the determination of the heterogeneity of labor incomes. The basic link between human capital investments and labor income is marginal productivity. That is, an individual's increased investments in himself will increase his marginal productivity, and this will in turn increase his labor income. In a world of perfect competition the distribution of earned income would be identical with the distribution of marginal productivity.

Human capital theory offers an improvement to the old neo-classical assumptions of homogeneity of labor. The newer theory takes explicit account of heterogeneous labor by way of what may be conceived of as different vectors of productivity. The demand for labor is a function of a weighted factor of the separate productivity components, and wages will in turn vary with a weighted combination of those separate components. Within the context of human capital theory, this has become the major theoretical justification for the empirical analyses of wage and income variations; wage variations are viewed in terms of the human capital productivity components - ability (raw human capital), education, and experience.

Human capital theory can be used to determine data needs among planners and administrators in employment and training and vocational education programs. The human capital framework can be applied to the issue of the match between job openings and the supply of workers looking for jobs. On the demand side, data are needed on the number of current and projected job openings by occupation. Data are needed also on the extent of human capital required for an individual to fill a particular job opening. That is, data on the educational and experience requirements by occupation are needed. On the supply side, it is essential to have information on the educational and occupational experiences of the current and potential work force.

2. The Influence of Labor Market Segmentation Theories on Data Needs

Labor market segmentation theory rose in the late 1960s in large part in response to the inability of traditional economic theory to explain the failure of this country's war on poverty. Several variants of the theory arose more or less simultaneously among four groups of economists, who until that time had been working separately on the problems of poverty and underemployment in urban America (Gordon, 1973).

Segmentation theory differs markedly from neo-classical economic theory on two counts. The first is its attempt to take the institutional setting and institutional variables into explicit consideration in all analyses, and the second major difference lies in its tendency to focus on groups of people and the relations among them rather than on individuals alone.

An early version of segmentation theory - dual labor market theory - characterizes the segmentation of local labor markets into two distinct and separate categories which operate by fundamentally different rules. The primary market, as it is called, is characterized by jobs which offer good wages, good working conditions, job security, fringe benefits, and the opportunity for advancement. Jobs in the secondary market are characterized by the opposite (Piore, 1971). In a more recent explication of segmentation theory, Sum and Harrison (1978) have argued that jobs can be clustered by wages, productivities, degrees of on-the-job training, openness of the internal labor market, labor turnover, profits, and

market power of the firm. They further argued that mobility within clusters is significantly greater than mobility across clusters. In their terms, "the argument is that mobility is 'tracked', not that there isn't any mobility at all" (Sum and Harrison, 1978). This argument has great appeal to many employment and training planners and administrators and the problem of moving trainees from a lower to a higher tier of the labor market has become a salient issue.

The nature of internal labor markets is a related concern. An internal labor market is the promotion and internal mobility pattern which characterizes individual firms. In an internal labor market current employees are promoted or transferred from within the firm; individuals from outside the firm are denied access to these jobs which are filled internally. Occupations for which the employer hires individuals from outside the firm are described as ports of entry. Occupations classified as ports of entry tend to be those for which education and manpower programs should provide training (Doeringer and Piore, 1971).

Segmentation theorists have noted also that demographic groups are not evenly distributed across job clusters. The affirmative action, equal opportunity strategies, and compensatory education plans of recent years have sought to remedy the problem of maldistribution. Segmentation theorists have offered two related explanations for the persistence of these balkanized labor markets. First, they question the orthodox assumption that the profit-maximizing employer is able to evaluate his workers in terms of their individual characteristics. Here Michael Piore has substituted the notion of statistical discrimination (Piore, 1973). This concept is meant to capture the idea that employment decisions are made on the basis of a few readily assessed traits such as race, sex, demeanor, accent, and test scores. While these traits may tend to be statistically correlated with job performance, they are not necessarily causally related to it. In the hands of employers, knowledge of these traits are used to make (inexpensive and quick) categorical decisions rather than (expensive and time-consuming) individual decisions. Also, segmentation theorists have questioned the human capital assumption that all workers have a wide range of options among jobs and different forms of schooling. Segmentation theorists instead argue that workers' decisions

are constrained by social, economic, and environmental factors as well as by the statistical discrimination they face in the marketplace (Edwards, Reich, and Gordon, 1975).

In this regard, Sum and Harrison (1978) argue that it is necessary to investigate the interactions between work and the institutions which condition the nature of work - the family, the school system, and those institutions which govern the availability of welfare and illegal income - to understand how labor market clusters are reproduced.

Implicit in all formulations of the segmented labor market are the assumptions that the quality of jobs as well as the distribution of workers across all jobs should become more equitable through appropriate policy interventions.

Segmentation theory formally considers a wide range of social and economic variables in explaining the process of matching available jobs to available workers. It follows that program planning based on the segmentation theory framework requires an abundance of data. Sum and Harrison (1978) identified four categories of data requirements for segmented labor market research and policy analysis. These are:

1) The number and characteristics of operationally defined primary and secondary labor market jobs, including information on the occupations and industries in which such jobs are typically found as well as the economic characteristics of the establishments in which such jobs are concentrated;

2) The personal characteristics and prior labor force experiences of those individuals and subgroups of the population who are employed in primary and secondary jobs;

3) The processes by which the earnings of workers are set in the different segments of the economy; and

4) The mobility of workers within and between the various labor market segments.

C. Relation of Theories of Career Choice to Information Needs

1. Introduction

Individuals making career choice decisions and the guidance professionals who facilitate in the decisionmaking process require occupational information. Indeed, the CETA legislation mandates that the needs of youth receive particular attention in the development of an occupational information system. These needs should be served in both the school system and employment service offices.

Although vocational guidance professionals and individuals making vocational decisions are viewed as a distinct constituency, in practice a considerable amount of vocational guidance activities occur in conjunction with employment and training and vocational education activities. This is especially true in the area of employment and training where planners and counselors are likely to work together in an intake, referral, and placement office. The range of activities at Employment Service (ES) offices also exemplify the heavy overlap in the two major constituencies of occupational information. Employment Service offices are responsible for the generation and distribution of much of the data that is used by the vocational education and employment and training planners, as well as the guidance counselors, and ES offices are responsible for the counseling and placement functions as well. Whether placement activities should be undertaken in both the Employment Security offices and the vocational education institutions has been a source of continuing controversy. Although a significant portion of guidance activities takes place in the sphere of vocational education and employment and training activities, a second large arena of guidance activities remains grounded in counseling. Conceptually this counseling function is based on the field of psychology, and traditionally has been an activity of the school system. However, in recent years the notion of vocational counseling has expanded considerably and has extended into the array of career decisions which individuals must make throughout their working lives (Ginzberg, 1972).

While any counseling function is related integrally to education and employment and training activities, the theoretical literature on the two sets of activities have developed very separately. This section reviews the guidance and counseling literature and where possible, relates it to labor market theories reviewed above. However, the bulk of the literature deals with the individual decisionmaking process. Furthermore, the literature focuses primarily on the psychological abilities and needs of the individual, rather than on the effect of the economic and social context on the individual's vocational decisions. Because of this general thrust, the literature is severely limited in terms of relevance to the labor market and to the occupational information needs of the individual making a decision.

Occupational information needs can be inferred from two contemporary definitions of career guidance and career education. Based on the 1951 recommendation of psychologist Donald Super, the National Vocational Guidance Association amended its definition of vocational guidance. The increased importance placed on the psychological needs and adjustments of the individual are evident in the difference between the two definitions. The pre-1951 definition states that vocational guidance is "the process of assisting the individual to choose an occupation, prepare for it, and progress in it" (Herr and Cramer, 1979). In 1951 this rather straightforward definition was replaced. The revised definition states that vocational guidance is "the process of helping a person to develop and accept an integrated and adequate picture of himself and of his role in the world of work, to test this concept against reality, and to convert it into a reality, with satisfaction to himself and society" (Herr and Cramer, 1979). In a recent document Herr (1980) argued that this 1951 definition effectively blended the personal and vocational dimensions of guidance and "focused on self-understanding and self-acceptance as the evaluative bases to which can be related the occupational and educational alternatives available to the individual." Hoyt, et al (1974) similarly emphasize the needs of the individual in their definition of career education as "the total effort of public education and the community to help all individuals become familiar with the values of a work oriented society, to integrate these values into their personal value systems, and to implement these values into their lives in such a way that work becomes possible, meaningful, and satisfying to each individual."

These definitions highlight the need for a vast array of information to be used in a complex series of decisions, rather than identifying the particular types of information that is needed. These two definitions imply that the individual making a vocational decision requires information about himself and information about a range of occupations. The following section is a brief review of theories of the decisionmaking process. The review is intended to provide a focus for the subsequent discussion of the information needs of the individual.

There is both a host of vocational choice theories and a host of reviews of these theories. Because the purpose of this section is to provide a broad overview of vocational choice theories and to indicate the range of information needs deriving from the theories, and not to discuss the relative merits of the theories themselves, this section is based primarily on the reviews of other authors.

In a recent review Lawrence and McAdams (1978) categorized vocational development theories into three categories: 1) accident theories, 2) sociological/economic and systems theories, and 3) individual-centered theories. Lawrence and McAdams further note that these three categories can be viewed in a continuum of perceived individual control in shaping career decisions.

Accident theories are of little relevance here. Therefore, the remainder of this section offers brief summaries of the individual centered and sociological/economic theories.

2. Individual Centered Theories

Lawrence and McAdams (1978) viewed individual centered theories as falling into two camps: developmental and nondevelopmental theories. The developmental theories are characterized by an emphasis on the individual's development of a self-concept and on the decisionmaking process which results in the matching of the individual with an occupation. The vocational development theories of Ginzberg, Tiedeman, and Super are classified as developmental. In contrast, the nondevelopmental theories of Roe and Holland focus on the fitting of the individual to the job, rather than on the stages of the process by which this match occurs.

a. Ginzburg's Theory. In his early work Ginzberg (1951) identified three developmental stages of occupational choice: fantasy, tentative, and realistic. This theory originated from work with young adults, and Ginzberg viewed these developmental stages as near completion by age 21. He further argued that some decisions made by the individual were irreversible and that the decisionmaking process ended in compromise. In his 1972 reformulation of the original theory, Ginzberg asserted, "occupational choice is a lifelong process of decisionmaking in which the individual seeks to find the optimal fit between his career preparation and goals and the realities of the world of work" (Ginzberg,

1972). This theoretical revision appears to attenuate the developmental aspects of Ginzberg's theory. However, the four variables which Ginzberg identified as affecting vocational choice - reality factors, educational process factors, emotional factors, and personal value factors - are unaffected by the developmental status of his theory. The first two of these factors are clearly more tractable to distillation into occupational information than the latter two variables.

b. Tiedeman's Theory. Tiedeman has emphasized the process of vocational decisionmaking, dividing the choice process into two major periods. The first is a period of anticipation involving exploration, crystallization, choice and specification. The subsequent period of implementation and adjustment involves induction, transition, and maintenance. Tiedeman's theory does not address the kinds of information an individual may require to facilitate movement through the vocational choice process.

c. Super's Theory of Vocational Choice. The central tenet of Super's theory of vocational choice is his assertion that the choice of an occupation is a vehicle for actualizing the individual's self-concept. The work of Super can be summarized in terms of the decision-making process and the tasks involved in moving through the process (Lawrence and McAdams, 1978). Super has identified five life stages of vocational development: growth, exploration, establishment, maintenance, and decline. In addition, he has identified five tasks which an individual must accomplish to proceed through the stages. These tasks are: 1) crystallizing a vocational preference, 2) specifying a vocational preference, 3) implementing a vocational preference, 4) stabilizing in a vocation, and 5) consolidating status and advancing in a vocation. As with the previous theorists, Super does not address directly the information needs of the individual. However, Super's identification of tasks involved in the vocational choice process provides some basis to the argument that the individual will require information about occupations to undertake successfully at least the first three tasks listed above.

d. Roe's Theory. As mentioned above, Roe's theory is not considered developmental. Roe's work is structured with two major considerations. The first is the determination of the meaning of work

for the individual; the second is the classification of occupations into a coherent framework permitting analytical groupings and the subsequent relations of groupings of occupations to individuals. In addition, Roe developed a system of occupational classification. She identified six hierarchical levels of job performance. These levels were based on the criteria of responsibility, capacity, and skill requirements. The occupational categories are: (1) professional and managerial with independent responsibility, (2) professional and managerial with less significant responsibilities, (3) semi-professional and small business, (4) skilled, (5) semi-skilled, and (6) unskilled. Each of these occupational groupings will contain jobs with one of eight primary foci of activities: (1) services, (2) business-contact, (3) organization, (4) technology, (5) outdoor, (6) science, (7) general/cultural, and (8) arts and entertainment. Finally, Roe developed a theoretical model to explain the match between individual needs and their eventual occupational choice.

e. Holland's Theory. Holland's theory of vocational choice is similar in structure to that of Roe's. In essence, Holland asserts that an individual expresses his opinion through his choice of an occupation. Individuals have basic personality characteristics, and occupations tap the personality characteristics of individuals. The goal of vocational choice should be to find the optimum match between the individual's personality characteristics and the characteristics which are essential in the occupation of his choice. Six basic characteristics have been identified: 1) realistic, 2) investigative, 3) artistic, 4) social, 5) enterprising, and 6) conventional. These six traits can be scaled and both individuals and occupations can be located on the scale. Holland argues that the pairing of persons with environments will predict behavioral outcomes such as vocational choice, job changes, personal competence, and educational or social attainments.

Although Holland does not directly address the need for occupational information in vocational development, the need for such information can be inferred from his theory. If individuals are characterized by identifiable personality traits, if work in specific occupations selectively draws on these traits, and if individuals have the ability and opportunity to choose an occupation which most effectively utilizes one's

personality traits; it follows that the individual would benefit from information with which to make a vocational choice. The practical implications of the use of the Holland typology in the counseling process have been discussed in Holland (1973) and Holland and Gottfredson (1976).

Holland's occupational classification system has been supported empirically and extended to all occupations in both the Dictionary of Occupational Titles and Bureau of the Census classifications (Viernstein, 1971; Gottfredson and Brown, 1979). In addition, the Department of Labor has utilized the Holland classification scheme as the organizational framework of occupations in its recent Guide for Occupational Exploration (1979).

Both Roe's and Holland's theories provide useful input to the development of a framework for occupational information and its use in vocational decisionmaking. These two theories, especially that of Holland, underlie the need for the individual to have an accurate representation of oneself and ones needs and to possess an accurate knowledge of the qualities which will be required of the worker on the job. From Roe's theory it can be inferred that it is important to have information about such job qualities as skill requirements and work activities. Holland's theory suggests the need for this information, as well as information on methods of task achievement and problem solving. Among the individual centered theories of occupational choice, Holland's offers the most fruitful ground for the identification of occupational information needed for vocational choice.

3. Sociological and Economic Theories

The sociological and economic theories of vocational choice describe the environmental factors which affect the individual in his or her choice of an occupation and subsequent occupational experience. Unlike the individual centered theories, these theories emphasize the context within which the individual must make a decision, rather than the decisionmaking process itself.

Datta (1975) describes sociological models as concerned with the influence of socio-economic status, sex, and ethnicity on career choices. Despite references to such "sociological" models, a discussion of only

one theoretical model - status attainment - was found in the literature. However, status attainment theory is a theory of change in occupational status across generations more than a theory of vocational choice within a generation. In this theory, occupations are viewed as indicators of social status; family background, socio-economic status, education, and social psychological variables are then viewed as determinants of any one individual's occupational status.

The vocational choice literature has treated human capital theory and dual labor market theory as economic models of vocational development. While it is possible to view the two theories as theories of vocational development, they function more richly as theories of the labor market.

In a discussion of human capital and labor market segmentation as theories of vocational development, it is necessary to view the key theoretical variables as factors affecting the vocational development of individuals. Thus, in the context of human capital theory, one would argue that an individual's educational attainment and previous work experience will have a significant impact on the individual's occupational choice and subsequent vocational development. Similarly, in the context of labor market segmentation theory, one would argue that the individual's age, sex, race, and educational attainment will have an important impact on the individual's initial occupational choice, and that these factors, in combination with the individual's initial occupational choice, will have a significant impact on future vocational development.

These theories do not translate neatly into an individual's need for occupational information in making occupational choices. However, it is possible to argue that individuals require information which represents the major variables in each of these theories. For instance, status attainment theory suggests that the individual may want information about the status of particular occupations. Human capital theory more directly implies that the individual will benefit from information on the educational and experience requirements, opportunities for on-the-job training and the wages of occupations. Finally, labor market segmentation theory suggests that an individual would benefit from knowledge of the following characteristics of occupations: educational attainment levels, wages and benefits, working conditions, ports of

entry, career ladders, job tenure and stability, and age, sex, and race composition.

In summary, the individual centered theories of vocational development suggest that persons engaged in occupational choice need information about themselves and information about occupations. The individual should use the information to understand how his "traits" and needs can be most effectively used in the context of a job which will be satisfying to him. The weak links in these theories are the absence of specifications of the occupational information which an individual needs to make a choice and absence of a description of the process by which individuals combine information about occupations with information about themselves to come up with an occupational choice. Furthermore, these theories give no explicit consideration to the present and future structure of the labor market. On the other hand, the sociological and economic theories give no explicit consideration to the needs of the individual. However, these theories emphasize the economic and institutional constraints on the individual decisionmaking process and thereby imply that the individual would benefit from knowledge of the context within which he is making a decision.

IV. THE NEED FOR AN OCCUPATIONAL INFORMATION SYSTEM

A. Introduction

As indicated above, the two major groups using occupational information - individuals involved with planning and individuals involved with making vocational choices - are guided by vastly different theoretical perspectives in the use of occupational information. The different theoretical explanations across user groups highlight the different kinds of occupational information which are likely to be used by a program planner as an individual making a vocational choice. Similarly, within each user group the adoption of a single theoretical perspective by an individual is likely to influence the particular data elements which the individual considers most important in decisionmaking. But although persons in a single user group may adopt different theoretical perspectives to explain the role and status of an individual in the labor market and consequently place more or less importance on particular kinds of information, all individuals in a user group, e.g. all employment and training planners, perform essentially the same kinds of activities requiring occupational information.

The purpose of this section is to describe the activities for which each user group requires occupational information. The known and anticipated benefits to the use of occupational information in those activities will be discussed as well. The section will conclude with a discussion of the user groups' need for the systematic organization of occupational information.

B. Data Needs Among Planners

Mangum (1978) identified four major functions for which employment and unemployment data are needed by employment and training planners. These functions were identified by CETA directors at a conference sponsored by the National Commission on Employment and Unemployment Statistics. Mangum grouped the functions requiring data into the following four categories: (1) determining the amounts of Federal money which will be allocated to the prime sponsors, (2) meeting the Federal information requirements, (3) defending internal resource allocation decisions to local interest groups, and (4) planning programs. Program planning is the emphasis of this paper.

At the beginning stages of the planning process, planners must develop an understanding of the population and the labor market with which they are involved. To build a foundation for successful intervention, planners must answer several important questions (Mangum, 1978). First, the planner must know about potential clients. This requires data on the characteristics of the full population in the area, as well as detailed information about the eligible population. Second, the CETA administrator must develop an understanding of why individuals have become part of the eligible population and the factors which help them overcome economic dependency. Here the planner must use available information to determine the occupational barriers which the individual confronts and the services which the individual will need to overcome these barriers. Third, the planner requires detailed information about the local labor market to determine the current and future jobs which will be accessible to the CETA client. As indicated by Mangum, this in turn requires information to help guide education and training decisions and to help suggest placement possibilities.

In addition, Sum et al. (1977; 1978) argued that an occupational information system can be a key element in the effective planning of employment and training programs. They argued that to be effective, education and training programs must be based on a thorough understanding of future manpower requirements. This requires that the manpower planner have access to information on both current and projected occupational demand and occupational supply.

The use of occupational information in vocational education planning is intended to lead to more effective long-run investments in educational planning. Effective investment in educational planning requires the subsequent employment of individuals in the occupations for which they have been trained. Because manpower and vocational education planning share the same goals of productive employment, it follows that the information needs for the two activities overlap heavily. This point was made carefully in Sum et al. (1977; 1978).

Teeple (1971) argued that the shortcomings in local vocational education plans can be traced to the lack of a state requirement to pursue systematic annual and long-range planning at the local level and

to the lack of detailed job market and population projections. In addition, Copa and Irvin (1974) pointed out that because planners of education for work programs make changes at the margins of programs, it is essential to have knowledge of the changes in supply and demand by occupation. Finally, Barton and Fraser (1978) pointed out that an appropriate vocational education curriculum should be carried out on the basis of how employers train and hire. This requires additional information on the hiring standards and methods of employers.

In summary, education and employment and training planners require similar data for similar purposes. Seven basic planning-related activities for which data about the labor market are needed were identified in the literature. First, it is necessary to understand the current pattern of employment in the labor market. Second, the planner must understand how the current supply of labor is meeting the needs of the labor market. An understanding of the current mismatch between occupational supply and demand is needed to plan job placement and development activities. Knowledge of current shortages in the supply of labor can also be used in short-term training programs. Next it is necessary to understand the extent of the population with current or potential employment-related problems. This informs the planner of the proportion of the population that is in need of services. It is necessary to know the causes of these employment-related problems and to understand if the education and training with which the population will be provided will successfully prepare them for a current or future job opening. To know whether an individual is being appropriately prepared for an occupation, it is necessary to know both the skills which employers require in each occupation and the skills which are taught in the vocational education and training programs. It is also necessary to know future occupational skill needs and to plan curricula and curricula enrollments to meet these future needs. Finally, as individuals move through employment and training programs or through educational curricula, it is necessary to track the program participants to know how the services and training provided to them have affected their employment status.

With the proper information and the proper use of that information among program planners and administrators, a variety of benefits are

expected to occur: the role of institutions in the labor market will be improved, individuals will benefit from increased opportunity to obtain training which will result in a job, and society as a whole will benefit.

Lecht (1978), Stevens (1976), and Sum, et al. (1977, 1978) emphasize the likelihood of the improved functioning of institutions when information about the labor market is available. First, the quality of decisions made by and affecting these institutions should improve. The use of occupational information in educational planning increases the likelihood that the difference between effective demand and actual employment can be eliminated (Stevens, 1976). When training output matches job openings, fewer educational resources and training opportunities are wasted. A second benefit of information is the increased efficiency of decisions. Sum, Sawhney, and Mazzeo (1978) argued that the use of occupational information in decisionmaking could generate more favorable rates of return on public and private investments in education and training. This, too, has the dual benefit of less waste in training resources and human potential.

C. Data Needs in Career Decisionmaking

Occupational data is used in career decisionmaking for two major purposes: (1) to help individuals learn about and understand the range of career opportunities which are available or are likely to be available to them, and (2) to help individuals who are choosing an occupation to become aware of the occupations for which they can prepare themselves and which they would find rewarding (Fry, 1979; Holden, 1978; Barton and Fraser, 1978). This requires that individuals be given information about actual and projected job openings, which is similar in nature to the demand and supply data which are used by the employment and training and educational planners. Although the use of the information by the two groups is somewhat different the individual choosing an occupation also requires information which is similar to the information used by planners and administrators. However the kind of information which permits the individual to make a judgment as to whether he would find an occupation suitable to his abilities and needs, is not the kind of information which would be in general use among planners and administrators.

When information is provided to individuals, they have the opportunity to find jobs for which they are better suited (Yavitz and Morris, 1973; Parnes, 1975). With adequate occupational information, individuals will know how to prepare for specific occupations, the abilities and skills required in these occupations, and the varying working conditions and required behaviors of different occupations. Andrisani (1978) has pointed out that this array of information should aid the individual in selecting an occupation for which one is suited, as well as aid the individual in forming realistic expectations and aspirations. Andrisani points out that in an economic system in which youths are free to chose among various occupational and employment opportunities, the freedom to choose is hollow in the absence of adequate labor market knowledge. The use of occupational information in the formation of appropriate work attitudes is conceptually straightforward but remains empirically untested. In addition, it is anticipated that realistic expectations and aspirations are related to greater job satisfaction. Again, this relationship has not been tested directly. However, Holland's and Gottfredson's (1976) findings that individuals transfer into occupations which are more consistent with their personality characteristics over their working lives provides indirect support for their hypothesized relationship.

It is also anticipated that a more informed vocational choice will result in decreased job turnover (Andrisani 1978; Parnes, 1975). Because job turnover is one of the major contributors to the current high employment rate among youth, a further benefit of the increased use of occupational information in vocational choice is expected to be a lower incidence of unemployment among young workers.

As an indirect form of job search, the use of occupational information should also result in higher wages for the individual. It is consistent with human capital theory that both job search and the accumulation of occupational information are investments which lead to higher earnings (Parnes, 1975). In fact, there is some empirical evidence supporting this claim. Using a national sample of young men aged 14 to 24, Parnes and Kohen (1975) found that the youth's score on a simple occupational information test had a significantly positive effect on the

youth's occupational status and hourly wage early in the two years following the administration of the test. In a similar study, Stevenson (1978) found that a measure of labor market knowledge had a positive influence on the hourly wages for white and black youth of both sexes. Although these results are expected on the basis of human capital theory, the empirical evidence obtained from the Parnes and Kohen and the Stevenson study are the most persuasive evidence to date of the beneficial effects which can accrue to the individual as a result of her or his familiarity and application of occupation information. Indeed the Parnes and Kohen research is the first piece of economic research which supports the argument that occupational information is associated with a variety of measures of labor market success. Thus as a result of theory and these empirical studies, it is anticipated that the increased use of accurate occupational information will have a variety of beneficial effects on the conditions of labor market participation among youth.

D. Overall Benefits to Data Use

Society as a whole should benefit from improved access to labor market information. As pointed out by Yavitz and Morse (1973), the efficiency of a free market system depends to a significant degree on an adequate flow of information: "A number of recent transformations in our economy and social life reinforce long-standing beliefs of economists that labor market information has important externalities that justify its collection and dissemination by government" (Yavitz and Morris, 1973).

At a societal level these externalities include such benefits as: (1) increased market competition (Andrisani, 1978; Parnes, 1975); (2) increased productivity (Yavitz and Morse, 1973), and (3) increased equity (Yavitz and Morris, 1973; Parnes, 1975). One of the criteria of a free market is the free flow of information. It follows then that the increased flow of information about the labor market will result in an increase in competition in the labor market. Andrisani (1978) argued that the competitive forces in the labor market would be enhanced in several ways. He argued that if workers were more aware of the alternatives available to them employers would feel a stronger need to improve the quality of work. As an added benefit to employees Andrisani argued

that the increased competition resulting from improved occupational information is likely to result in reduced levels of unemployment. Employers are expected to benefit from improved occupation information because the increased flow of information should facilitate the efficient reallocation of labor in response to technological shifts. Second, increased productivity is likely to result from the more widespread job satisfaction of workers who have more knowledgeably selected the occupations in which they are employed. This is an empirical question which should present no major barriers to analysis. In economic terms Andrisani (1978) argued that improved occupational information should aid the movement of the labor market from disequilibrium to equilibrium. A labor market in equilibrium suggests that there would be a reallocation of labor such that workers would be matched with the jobs for which they are best suited. This reallocation, which would increase the efficiency of the labor market, should lead in turn to increased productivity.

Because labor market information is a public good, the increased availability of information has the potential for increasing equity in society. Yavitz and Morse (1973) pointed out that the unequal distribution of resources available to finance job searchs will result in an unequal distribution of occupational information from the job search process and hence unequal benefits derived from job searchs. The increased availability of occupational information is expected to provide individuals who have fewer resources with which to finance a job search the opportunity to increase their knowledge about the labor market and subsequently to choose and prepare for an occupation for which they are well suited. The increased availability of information is expected to create an improved opportunity to choose an appropriate occupation across individuals of all socioeconomic groups. As pointed out by Andrisani (1978) because occupational information is positively associated with occupational status and earnings and because occupational information currently is possessed disproportionately by white, male, and higher SES youths, a more widespread distribution of occupational information among youths should reduce race, sex, and class differences in unemployment and income. Finally, Parnes (1975) has also suggested that an equal opportunity to choose an occupation may narrow earnings differentials

across occupations which are artificially inflated as a result of unequal access to the occupations.

On a theoretical basis the arguments for the increased availability of occupational information are persuasive. Although little empirical work has been done, the available evidence supports the theoretical arguments. The need for occupational information which is expressed among employment and training and vocational education planners and employment counselors has become increasingly widespread in the past decade. Because the theoretical and empirical basis of their argument is so strong, it is anticipated that the need for occupational information will meet with increasing support among local, state, and Federal officials.

E. Need for an Occupational Information System

The previous discussion has highlighted the need for and the benefits to be derived from the use of occupational information in planning and vocational decisionmaking. However, data must also be structured in order to be useful. It is this structure which is the delineating characteristic of an occupational information system. The definition of such a system is carefully developed in a recent NOICC publication.

> An information system may be thought of as an organization or network for the collection and/or distribution of information. For NOICC/SOICC purposes, the information being collected and distributed is related to occupations. The purpose, simply stated, is to provide to users the occupationally related information necessary for decisionmaking. (NOICC, 1979)

The important role which structure plays in the distribution of information has been most thoroughly demonstrated in the Drewes and Katz study (1975) of data use in vocational education planning. Their findings indicate that an occupational information system should improve both the awareness of and the access to information which is currently available in disparate locations. Local vocational education planners were "unaware of the existing published manpower data available from the Employment Security offices, BLS, and other government agencies" (Drewes and Katz, 1975). They also found that vocational education planners lacked adequate access to information; even if individuals were aware that particular kinds of information existed, they did not know where they could obtain it. Thal-Larsen (1972) also argued that an occupational information system was needed to utilize most effectively the potential data sources which are available to planners.

A related issue is the untimeliness with which many of the vocational education planners acquired information. An operational occupational information system would relieve this problem by ensuring the standardized distribution of information.

The systematic collection and provision of information will result in the greater uniformity and consistency across categories of information. Lawson (1973) considered this to be the greatest single advantage of an occupational information system.

Finally, the systematic provision of information is expected to result in greater efficiency and cost-effectiveness in the distribution and access to data. Thal-Larsen (1972) argued that the absence of a system resulted in costs in terms of data gathering and inability to use available data.

Interestingly, none of the authors reviewed in this paper argued at length about the need for an actual system for the presentation and access of occupational information. However, although the need for a system was not argued explicitly, the need for the systematic presentation of occupational information clearly underlined their more detailed discussions of the data elements recommended for a system.

V. REVIEW OF DATA ELEMENTS RECOMMENDED FOR INCLUSION IN AN OCCUPATIONAL INFORMATION SYSTEM

A. Introduction

With an understanding of the labor market concepts which guide manpower and vocational education planners and knowledge of the activities for which planners, administrators, and guidance counselors require data, it is possible to review the needed data elements identified in the literature. Data elements are discussed in this review if they meet one or more of the following conditions: (1) the data element was recommended for inclusion in an occupational information system, (2) the data element was identified as essential to the performance of the planning or adminstration functions, or (3) the data element was recommended for use in the guidance process. However, in many cases the data needs expressed by the authors were not discussed in terms of the concepts, categories, or activities discussed in this paper. Some authors were not specific in their definitions of data elements, some used a more vernacular terminology, and others simply categorized the data differently. The literature also varied widely in scope. Some dealt with the data elements needed in an operational occupational information system, while other literature was limited to the discussion of the use of a single data element in a planning, administration, or guidance function. Clearly, it was necessary to impose a structure on this variety of literature. The data elements recommended for inclusion in an occupational information system in this paper have been divided into five major categories: occupational demand, occupational supply, supply/demand match, occupational characteristics, and complementary information. These categories conform to the categories identified by the National Occupational Information Coordinating Committee (NOICC, 1979). In addition, these categories provided a complete framework from which to view data needs, and it was possible to discuss specific data elements as components of these categories with no known misrepresentations of authors' meanings.

All data elements discussed in this section have been recommended for inclusion in an occupational information system or have been discussed as providing valuable information about the labor market by one or more authors reviewed in this paper. Because the literature reviewed varied so widely in scope and because it is not possible to discuss fully individual contributions to the literature, two major appendices are included with the body of the text. Appendix A contains a table for each data element which is recommended for inclusion in an occupational information system in this paper. For each data element, authors who recommended the inclusion of the element are listed. These tables make it possible for the reader to see which authors have recommended inclusion of particular data elements and to assess quickly the extent of interest in that element in the available literature. For readers interested in the use of particular data elements, this table will indicate where to look for additional information. To aid in this search process, Appendix B has been included. It is an annotated bibliography of all occupational information references cited in this paper. The annotations are intended to inform the reader of the scope and content of the individual contributions to the literature.

The following section discusses the data elements representing occupational demand which were recommended for inclusion in an occupational information system. Discussions of elements representing occupational supply, supply/demand match, occupational characteristics, and complementary information follow. The discussion which follows is based heavily on the range of literature which was reviewed.

B. Occupational Demand Data

In their program planning efforts vocational education and employment and training planners and administrators are able to influence primarily occupational supply. The major exception to this situation occurs in the southeastern states, where economic development plans often attempt to use the vocational education system as a drawing card for industry. However, to ensure that the workers which the occupational education and skill training programs are supplying to the work force will find job openings in the occupations for which they are trained, vocational education and employment and training personnel require

information about the current and projected demand for workers by occupation. Measures of current demand by occupation are also needed for counselors directly involved in the placement function.

The need for four measures of occupational demand was identified in the literature. This included data on: (1) current occupational employment, (2) current job openings, (3) current employment by industry, and (4) projected occupational demand.

1. Current Occupational Employment

It is essential to have an understanding of the current occupational composition of the labor market if planners, administrators, and guidance personnel are to understand the environment in which they work. This was recognized by nearly every author who discussed a range of data needs.

The most commonly addressed need was for aggregate data on employment by occupation across a meaningful geographic area. Clearly, the most appropriate geographic area differs by the group using the data. This variation in the geographic area across which data is needed was a recurring issue in the literature, but will not be addressed in detail in this paper. Where a geographic area was specified, requests for data on employment by occupation for counties, SMSA's, and states were most common. Sum, Sawhney, and Herrnstadt (1977) recommended that data on current employment by occupation be updated every one to two years. This is a more freguent update than that occurring at present with the Occupational Employment Statistics Program (U.S. Department of Labor, 1979a). No other authors addressed themselves to the need for the increased timeliness of the data.

Several authors specifically mentioned the need for current occupational employment data by sex, race, and/or age (Thal-Larsen, 1972; U.S. Department of Labor, 1974; Stern, 1975; Lecht, 1978). Because of the widespread need for the demographic breakdown of occupational employment, other authors may have assumed such detail would be provided as a standard matter. Some demographic detail is currently required in CETA prime sponsor annual plans. The demographic breakdown of occupational employment is useful to planners, administrators, counselors, and job seekers alike. For individuals planning the future supply of trained workers,

knowledge of race and sex occupational segregation patterns can be valuable in the targeting of groups of individuals to occupations in which they have traditionally lacked access to employment. A primary use of occupational data broken down by demographic group is in the development of EEO and Affirmative Action plans. In addition, individuals making career choices or seeking jobs may have occupational preferences based in part on the demographic composition of the occupation.

Margaret Thal-Larsen (1972) recommended the inclusion of occupational employment by establishment in her study of occupational information needs in the San Francisco area labor market. She further recommended that the occupational information be presented by DOT job titles. The availability of such disaggregated data provides user groups with knowledge of the significant occupations of employment in the area, as well as knowledge of how these workers are distributed across firms. If information identifying the individual firms was made available, counselors would have increased knowledge of the potential employment locations of job seekers. However, at this time regularly published data on a disaggregated basis are not available, due to policies that prohibit disclosure of an individual firm's operations.

2. Current Job Openings

Estimates of current job openings can be a valuable data resource for policymakers and counselors. Frumerman (1978) described the policymaking uses of job vacancy statistics as: (1) contributing to business cycle analysis, (2) helping to determine the cause of unemployment (3) measuring the efficiency of labor markets, and (4) identifying emerging labor shortages. For Employment Security counselors and personnel, vacancy statistics potentially can be used for job placements. Frumerman further suggested that vacancy statistics may be used to aid Employment Security agencies in job development activities.

The value of these data was recognized by a variety of authors. Mangum (1978) and Young (1979) both cited the planner's need for data on current job openings. Stern (1975) also expressed the need for job vacancy data in a labor market information system. Stern recommended that this data be made available by state, county, SMSA, and community.

Thal-Larsen (1972) recommended the inclusion of occupational job opening data by establishment in a labor market information system. She argued that detailed establishment data was essential in identifying training needs and recommending job placements.

Stern (1975) suggested that hard-to-fill job openings be identified on a statewide basis. However, Lecht argued that job openings data must be used carefully as a guide to planning, because openings may exist in occupations with "low earnings, formidable educational requirements, or difficulties in entering by women or blacks" (Lecht, 1977). In such cases, planners must carefully consider the virtues in training individuals for such occupations, and demand data must be used in conjunction with occupational characteristics data for a solid base in program planning.

3. Projected Occupational Demand

The need for data about future occupational demand was cited frequently in the literature. Projected demand can be further broken down into two major components: expansion/reduction demand and replacement demand. However, this distinction was made rarely in the literature, and that precedent is adopted here as well.

In their book about the practice of manpower forecasting, Ahamad and Blaug (1973) made the distinction between manpower forecasts made for manpower policy and forecasts made for use by educational planners. According to Ahamad and Blaug, occupational projections to be used in providing information for training programs, vocational guidance and, what they call, "a wide variety of schemes to eliminate structural and regional unemployment" should forecast demand one to five years in the future. In contrast, they stated that forecasts geared to the educational system should be long-term, generally projecting 10 to 20 years into the future.

However, this clear distinction is not made in the more user-oriented literature. Thal-Larsen (1972) recommended that occupational demand data be available on a one and a five year basis. Sum, et al. (1977; 1978) recommended that projected levels of employment, as well as projected job openings, be available on an annual basis. Mangum (1978) also argued that short-term demand by skill requirement is necessary for

the planning of training programs. In terms of using occupational projections to plan for manpower program planning, Copa and Irwin (1974) noted that it was most important to have occupational demand data on programs which train workers for entry level positions.

Lecht (1974) argued that the development of regional, state, and local manpower projections was a priority need to improve the utilization of manpower information in vocational education planning. In a subsequent article, Lecht (1978) identified the increased use of projected occupational demand in employment and training and vocational education planning was an outgrowth of national policy needs. In particular, he felt that the increased importance placed on demand data in program planning had developed out of concern for the employment and training needs of disadvantaged groups. In this same article he further identified three distinct uses of occupational projections: (1) to serve as an early warning system to highlight prospective changes in job openings (2) to anticipate manpower bottlenecks, and (3) to study the employment consequences of government policies and expenditures.

Although the need for projected demand by detailed occupation codes is noted in the literature, several authors have argued that projections may not be needed at such a detailed level. In particular, Shea (1969) noted that for purposes of vocational education planning it may be sufficient to have only a general knowledge of the growth potential of occupations. Lecht (1978) also stated that projected occupational demand may be more useful on an economy-wide basis, rather than in specific occupational fields in sub-state areas.

4. Employment by Industry

Occupational employment by industry is used to help understand the patterns of employment in a labor market. In combination with knowledge of the industrial affiliation of firms, it can also be useful in locating potential employment opportunities in various occupations. This information about industrial staffing patterns can be valuable for program planners and job development specialists alike. Although a number of authors identified the need for a current industry-occupation

matrix, only two documents (Thal-Larsen, 1972; U.S. Department of Labor, 1974b) cited the need for occupational employment projections by industry.

C. Occupational Supply Data

Occupational supply is comprised of a variety of factors. Because of the large number of sources of supply, the measurement of occupational supply is considerably more difficult than the measurement of occupational demand. The major categories of occupational supply identified in the literature are: currently unemployed individuals, entrants from educational institutions, occupational transfers, labor force entrants/reentrants, and occupational migration data.

1. Current Unemployment

Data on the number of unemployed individuals in a labor market area are essential to manpower planners. This is the single most important data element defining the target group which planners will serve. Because data on unemployment are so useful in defining target groups, it is important to have the data broken down by demographic group. In particular, it was recommended that the data be available by age, sex, ethnicity, and handicapped status (Teeple, 1971; U.S. Department of Labor, 1974b; Ehrle, 1965; Levine, 1972). CETA annual plans also require data on the unemployment status of a variety of target groups.

Data on current unemployment may also be of short-term use to vocational education planners. Knowledge of the unemployment status of various occupational groups can give education planners a basic idea of the need for the expansion or reduction of particular training programs. Of course, knowledge of the employment status of graduates by program status would be significantly more useful. In addition, data on unemployment by occupation can be a useful guide to job seekers by providing a general indication of the relative ease in finding work across occupations.

Each of these uses of unemployment data is dependent on the availability of unemployment data by occupation. However, Wool (1979) argued that the greatest weakness in unemployment data is the occupational coverage. He attributed this weakness to the classification of unemployed workers by previous occupation (rather than the occupation in which they are looking for work) and the failure to include the occupation of new labor force entrants in the statistics.

These problems result from the manner in which occupational employment is generally measured. ESARS data on unemployment insurance claimants, public assistance recipients, and Employment Security job applicants are used to measure occupational unemployment. These data are systematically biased. Mangum (1978) contended that a small percent of the number of individuals who are actually unemployed are covered by unemployment insurance. This tends to underestimate the average level of unemployment and in particular, to underestimate the unemployment of certain segments of the population. Mangum recommended that adjustments be made to unemployment insurance claimant data to compensate for the known biases in the data.

In addition, the failure to provide statistics on discouraged workers results in a major gap in the current unemployment statistics. Although the absence of data on discouraged workers probably does not result in a significant measurement error for occupational information, the gap is particularly serious for employment and training planners who could use discouraged worker data as a valuable economic indicator. The availability of statistics on discouraged workers would improve significantly the employment and training planner's ability to estimate a target population.

2. Entrants from Educational and Training Programs

A second major component of occupational supply are entrants to the labor force through the various education and training programs. It is possible to look at three distinct dimensions of the education and training system's contribution of workers to the labor market: educational enrollments, educational completions, and, educational follow-up. It is important to recognize that educational enrollments or completions do not themselves constitute occupational supply. It is necessary to derive occupational supply from enrollment and completion data. Because information about the labor market behavior of individuals who have completed specific educational and training programs can be applied to data on current enrollments and recent completions to estimate occupation supply, follow-up data is an integral component of the calculations for occupational supply.

a. Educational Enrollments. Occupational supply projections are less common than occupational demand projections. Lecht (1978) stated that they are generally confined to occupations with lengthy and specialized training. Perhaps the best examples of occupations for which supply is projected is physicians and teachers. Although these projections are generally unavailable, the need for occupational supply projections was identified in the literature.

The current or short-term future supply of workers to the labor market is represented primarily by current educational enrollments. Educational enrollments in vocational education programs have received the greatest attention in the literature. The relationship of vocational education to the labor market is relatively unambiguous, in that many vocational education curricula are designed to train individuals to enter a particular occupation. State vocational education plans have also been explicitly required for over a decade to relate vocational education programs to needs in the local labor market. Despite the fact that the plans have been treated as compliance documents (Drewes and Katz, 1975), a general awareness has been created among the personnel involved that vocational education should relate to labor market opportunities.

The need for data on current enrollments was noted by a number of authors. However, in order to relate the educational enrollments to occupational supply, it is necessary to convert standard educational program codes (i.e. U.S.O.E. codes) to one of the standard occupational classifications. The "crosswalks" which have been developed are tools which indicate how educational enrollments are related to occupational supply. One crosswalk procedure has been discussed in detail by LeCam and Sum (1978) and LeCam (1979). A detailed procedure for relating educational enrollments and occupational supply is also identified in Volume 2 of the OIS Handbook.

As a result of the emphasis on compensatory education and the attenuation of occupational segregation, it is necessary to have a variety of data on the characteristics of individuals enrolled in educational programs (Shea, 1969). The need for enrollment data by social, demographic, and enrollment characteristics (New England Regional Commis-

sion, 1978), handicap status (Teeple, 1971), and disadvantagement (Stern, 1975) have been noted by various authors.

b. Vocational Education Completions. Data on completions from vocational education programs are also needed. Vocational education planners require this information to plan the number of enrollments required to achieve graduation targets and to estimate the number of annual additions to the labor supply from educational institutions (Sum, Sawhney, and Mazzeo, 1978). Mangum (1978) argued that employment and training planners need this information as well to know what "their competition is."

This information should be compiled by demographic and other relevant characteristics in order to trace the completion rates of various segments of the population. These calculations would help vocational education planners assess the impact of their programs across groups and to assess whether programs are reaching intended target groups.

c. Vocational Education Follow-up Data. Follow-up data provide information about the current status of vocational education graduates. These data are essential inputs in making judgments about the relevance of training programs to competitive labor markets (New England Regional Commission, 1978). Here the most important data will be the placement rate of program graduates, the training relatedness of the jobs in which they are currently employed, and their wage rates in those jobs. Teeple (1971) noted the absence of placement and follow-up data by demographic and target groups. However, the information needed to evaluate the impact programs have on selected target groups is expected to be provided by the newly operational Vocational Education Data System.

d. Sources of Educational and Training Supply, Except Vocational Education. The enrollment, completion, and follow-up data for the vocational education system is only one component of the sources of supply to the labor force from the education and training system. This is given general recognition by several authors. Shea (1969) discussed the need of vocational education planners for data all existing sources of occupational supply. Teeple (1971) cited the need for educational data from other sectors. Mangum (1978) also discussed the need of manpower planners for all school output data.

However, few authors cited the full range of sources of labor supply. A Bureau of Labor Statistics Bulletin (1974) and a later Bureau of Labor Statistics' study of occupational training information (1978) contain the widest enumeration of sources of occupational supply for which data are needed. The latter document also contains a discussion of the quantity and quality of the data available in New England for each source of occupational supply except enrollees in baccalaureate programs. In addition to post-secondary vocational education, data on the following occupational training sectors are needed: (1) private post-secondary schools, (2) sub-baccalaureate collegiate training, (3) apprenticeships, (4) CETA training programs, (5) training in hospital schools, (6) training related to vocational rehabilitation, and (7) training in the armed forces (U.S. Department of Labor, Bureau of Labor Statistics, 1978). Sum, Sawhney, and Herrnstadt (1977) also cited the need for data on vocational training in secondary schools and employer's formal on-the-job training programs.

Available data from these sources appear to vary widely in quality. However, the need for education and training data beyond the vocational education system was cited by a number of authors concerned with employment and training and vocational education planning, and it is recommended that, whenever possible, these data be included in an occupational information system.

3. Occupational Transfers

An additional source of occupational supply is transfers from other occupations. Data on this source of supply are available only from the Current Population Survey and the 1970 Census of Population. Little is known about the extent and patterns of occupational transfers. However, this may be a significant source of entry in some occupations. If this is the case, data on transfers may be an important source of information to the program planning process.

However, currently the use of the data for program planning purposes is limited for two major reasons. First, at this point little is known about the importance of occupational transfers as a source of labor supply. Similarly little is known about the occupations in which occupational transfers are an important component of supply. Put simply,

knowledge about the conditions, nature, and extent of occupational transfers must expand before occupational transfers can be reliably used in the estimation of occupational supply. Only at this time can occupational transfer data be used in program planning. The second factor, which constrains the knowledge about occupational transfers and the use of that knowledge in program planning, is the relative unavailability of appropriate data. The data which is available currently from the Current Population Survey and the Census of Population cannot be used directly for the calculation of local occupational supply estimates.

4. Labor Force Entrants/Reentrants

The importance of data on labor force entrants and reentrants was recognized as important in the policymaking process. Several authors cited the need for such data in an occupational information system. Kalachek (1978) and Smith and Vanski (1978) provided detailed arguments for the use of this data in decisionmaking. Gross change data are tabulated, but not published, in conjunction with the Current Population Survey. They provide estimates of the total number of individuals who move between labor force categories from one month to the next. As pointed out by Smith and Vanski (1978), net change data mask the dynamic behavior underlying changes in labor force size. For example, the degrees of labor force mobility differs widely among demographic groups. It is also likely that labor force mobility is concentrated in selected occupations. Gross change data can be used to investigate these patterns across demographic and occupational groups. These data are likely to be of the most use to individuals approach employment and training program planning from the perspective of a segmented labor market.

5. Geographic Mobility

Finally, data are needed on occupational supply resulting from geographic mobility. Labor market migration data is available only in the Census of Population and from special longitudinal surveys. Although these data are not likely to figure significantly in the planning of education and training programs, its contribution to occupational supply was cited by a number of authors. The utility of data for estimates of local occupational supply and for program planning purposes is limited by the lack of reliable data on a local labor market basis.

D. Supply/Demand Match

The inclusion of a data system indicating the projected match between supply and demand by occupation is a valuable element in an occupational information system; the analysis of the match between supply and demand is a major indicator of the number of anticipated unskilled job openings in an occupation. The supply/demand match can indicate whether an abundance of electronics technicians are being trained in a labor market or if a shortage of registered nurses is anticipated.

Although it is an essential element of an occupational information system, data on the supply/demand match by occupation are not available currently on a subnational level. The matching process is a complicated procedure, because of the various classification schemes by which occupational supply and occupational demand data are coded and the absence of an isomorphic system to convert educational courses in which individuals are trained to the occupations for which the individuals are being trained. The 1978 Bureau of Labor Statistics study provides a valuable discussion of the supply/demand match. The study points out that occupational demand is comprised of a flow of jobs, while occupational supply is comprised of a flow of individuals. A supply/demand match involves the derivation of two components: the projected number of individuals available to work in an occupation and the number of jobs available in the occupation for these individuals to fill. When these two components are matched, the labor market will be in equilibrium.

There are two generally accepted tools for matching occupational supply and demand (NOICC, 1979). The first tool involves grouping occupations by common skill requirements or work activities. On the supply side, educational clusters are formed. These clusters are based on the skills taught as part of the course curriculum. Homogeneous clusters of occupations and educational courses are matched to complete the supply/ demand match. The second approach to supply/demand matching involves the use of direct code crosswalks. The crosswalk system is utilized to match U.S. Dictionary of Occupational Title (DOT) or Census occupational codes with U.S. Office of Education (USOE) codes. This matching process and the issues involved in its use are described in detail in LeCam and Sum (1978) and LeCam (1979).

However a variety of interactions between supply and demand must also be taken into account when calculating the supply/demand match. As pointed out by the Bureau of Labor Statistics (1978) the number of workers available affects industry demands for an occupation and in turn the number of jobs available affects individual career choices. These are important factors which currently cannot be incorporated into the process of supply/demand match. Because of the complex interrelationships, the Bureau of Labor Statistics (1978) concluded that much further research was necessary before any real analysis of the supply/demand match can be performed.

The supply/demand match is not discussed widely in the literature. Although many of the authors identified the need for supply/demand match in an occupational information system, other authors discussed the need for occupational demand data and occupational supply data without reference to the need for a supply/demand match. However, in this paper the assumption is made that even among those authors who made no explicit mention of the need for a supply/demand match, the need for this match is explicitly recognized. It is expected that the supply/demand match has not been given more attention in the literature, because of the complexities involved in its calculation. In addition, unlike many of the other data elements which have been recommended for inclusion in an occupational information system, estimates of supply/demand match are not readily available through current Federal data collection programs. With the implementation of the vocational education data system (VEDS), it is anticipated that the need for a subnational supply/demand match will be given greater attention among employment and education and training planners.

E. Occupational Characteristics

Planners and administrators, as well as counselors, require a variety of information about the occupations which individuals select and for which they prepare. Program planners and administrators must consider some of the following questions in identifying the occupations for which individuals will be prepared:

1) Is the quality of the occupation such that individuals should be trained to fill available job openings? Important factors to consider are the health hazards of the occupation and the adequacy of the usual wage scale.
2) Can individuals be trained for the occupation in the length of the scheduled program training period? Here it is important to know whether individuals will acquire the needed skills and whether the occupation is, in fact, an entry level occupation.
3) In addition to the usual supply and demand considerations, is it likely that the individual will be able to get a job in this occupation after successfully completing the necessary training? This requires information about special entry barriers to the occupation.

Counselors and individuals making vocational choices require a vast array of detailed information about occupations. They will require information to answer the kinds of questions listed above, as well as information about how to prepare for and acquire a job in the occupation and how the activities and lifestyle associated with the occupation meet an individual's needs.

Three major categories of occupational characteristics were identified in the literature. The first category is information about the skills, duties, activities, and responsibilities of work in that occupation. Basically, this information is intended to inform the individual about what one does in the occupation. The second category of data provides information about how one becomes employed in the occupation, including information about how to prepare oneself for the occupation, how to acquire a job in the occupation, and the relation of the occupation to similar occupations. The third major category is comprised of more detailed characteristics of employment in the occupation.

1. Job Duties

Although information about specific job duties may be more directly useful to individuals involved in career choice decisions, the planning literature also identified the need for this specific type of information (Shea, 1969; U.S. Department of Labor, 1974). In the program planning literature, information about job duties was discussed as perform-

ance requirements (Shea, 1969) or skill requirements (U.S. Department of Labor, 1974). Such information can be of use to program planners in identifying the skills an enrollee must learn in a program. Information on skill requirements is most valuable when used in combination with information about education and experience requirements.

Counselors and individuals making career choice decisions will have a broader interest in information on job duties. Surprisingly, reasons for the need for information on job duties were not discussed in the literature reviewed for this effort. But the rationale for this kind of information is quite clear: if an individual is going to choose an occupation, one must know what one will do in it. However, the need for this kind of information can also be tied in more clearly with the theoretical literature on career decisionmaking. Holland's theory may be of particular use in identifying information which would be most valuable in helping an individual make a vocational decision which will most suit one's temperament and needs. Activity characteristics which define a realistic versus a conventional versus a social occupation could be identified. When an individual is investigating an occupation, one could be informed of these occupational activity characteristics, in addition to one's own personality characteristics.

In addition to recommending the inclusion of information on job characteristics in an occupational information system, Thal-Larsen (1972) also recommended the inclusion of information on probable changes in the characteristics of a typical job in the occupation.

2. Information on Preparation and Acquisition Process

Three categories of information on how to become employed in an occupation were identified in the literature: how to prepare for an occupation, how to get a job in the occupation and the relation to other occupations.

a. Occupational Requirements. Two kinds of information are needed on preparation requirements. These are education and experience requirements. The distinction between these two kinds of requirements was not made in the literature. Instead, authors cited the need for information on job entry requirements (Rodgers, 1976), training requirements (Mangum, 1978) and hiring standards (Shea, 1969; Sum, et al., 1977;

1978). Because these requirements are generally expressed in terms of education and job experience, it is recommended that occupational requirements be labeled in this way in an occupational information system. A related piece of needed information identified in the literature is a description of any licenses or certificates that must be obtained as a condition for employment in a given occupation.

Program planners require information on educational and experience requirements to judge whether their training programs will prepare enrollees for work in the intended occupation. Where discrepancies are found between the typical educational and experience requirements in an occupation and the preparation in a vocational education or manpower program appropriate changes can be made. Individuals making vocational choices require information about educational and experience requirements to decide if they are willing to undergo the preparation necessary to obtain a job in an occupation which they are considering.

b. Hiring Channels/Entry Methods. Thal-Larsen (1972) identified the need for information about the customary hiring channels for jobs in an occupation. Although a further delineation of hiring channels was not found, it is assumed that this refers to the customary ways in which workers in an occupation become employed in it. It is recommended that this include typical successful methods of job search.

Thal-Larsen (1972) also recommended that information be included about the seasonality of the job search or hiring process in a given occupation.

c. Entry Barriers. Barriers to employment in an occupation were recommended for inclusion in an occupational information system by a number of authors. Barriers might include traditional sex or race segregation or inability to adapt job duties to the constraints of particular handicaps. This information is important to program planners to guide them in setting placement rates, identifying target groups, and providing special placement services for these target groups. An individual making a choice about the occupation one wants to enter needs this information to assess the institutional difficulties one may face in obtaining work in the occupation.

d. Career Ladders. Information about the relation to other occupations includes identification of entry-level occupations, other typical ports of entry occupations, and typical career ladders.

Sum, et al. (1977; 1978) pointed out that employment and training legislation mandates that program participants be prepared for entry-level occupations. For this reason employment and training planners must be familiar with entry-level occupations in the area. Individuals choosing an occupation also need to know if they can directly enter the occupation or if they must move through a series of related occupations before obtaining the kind of job they want.

A related piece of information is whether the occupation is a typical port-of-entry. That is, can an individual obtain a job in that occupation by applying from outside the firm or must the individual typically be employed with the firm before he will be considered for a job in the occupation. This is important information to employment and training planners, because they should avoid training in occupations which are not ports-of-entry. It is also important for job seekers in helping them to focus their job search. Individuals choosing an occupation will benefit from this information in selecting a path by which to arrive at a job.

Information about career ladders is also important. Program planners will want to know if they are preparing individuals for an occupation for which there is the likelihood of some upward mobility. Individuals may want to use this information about promotion opportunities as a basis for making a vocational choice.

Rodgers (1977) also identified the need for information about "skills transference" across occupations. Individuals concerned with maximizing their occupational opportunities will be particularly interested in this information.

3. Characteristics of Employment in the Occupation

Three sets of characteristics of occupational employment were identified in the literature. These are the financial rewards associated with work in an occupation, the time dimension of work in an occupation, and the environmental and institutional conditions of work.

a. Financial Information. All user groups are interested in the wages and salary associated with work in a particular occupation. Vocational education and employment and training program planners need this information to ensure that the occupations for which individuals are being trained will provide the program graduate with an adequate standard of living. Lecht (1977) has argued particularly effectively for the need for occupational wage data in program planning.

> The emphasis on 'gainful employment' in the 1968 Amendments underscores the importance of a greater concentration on earnings in the occupation prepared for in program priorities and planning. Greater concern with earnings would lessen the tendency to enroll students, especially women, in programs leading to employment in poorly paid fields ... The concentration on job openings with limited consideration given to earnings has facilitated the establishment of programs more likley to perpetuate low incomes than to provide an escape from them.

Individuals making career choice decisions will also want to use accurate wage and salary information as a criterion in the decisionmaking process, particularly in an era characterized by economic uncertainty.

Several authors also cited the need for information about the usual kinds of fringe benefits associated with an occupation. This information is unlikely to have a significant effect in program planning; the wage information is likely to be given more serious consideration. Neither are individuals likely to give this information as serious consideration as it deserves. Information on fringe benefits grouped by occupational category is likely to mask the wide variety of fringe benefit packages offered by employers. However, if youth become familiar with the concept of fringe benefits and the standard components of a fringe benefit package in the vocational choice process, they are likely to bring this information to bear in selecting a job with one employer over another.

Finally, Thal-Larsen (1972) recommended the inclusion of information about the expenses, such as uniforms and tools, associated with work in an occupation.

b. Time Dimension of Work. Information about the usual number of hours worked in an occupation may be an important consideration for some individuals choosing an occupation. This information should also include data on the existence of shifts in the occupation.

Information about the seasonality of work in the occupation was recommended for inclusion by several authors. Interestingly, only authors writing from the guidance perspective identified regularity of employment as an important component of occupational information.

Expected job tenure (Thal-Larsen, 1972) and job security (Lecht, 1977) were recommended for inclusion in an occupational information system. Program planners may find this information useful for avoiding training programs in occupations characterized by low job tenure and/or security. Individuals in the process of choosing a vocation will benefit from this information as well. Here individuals examining the characteristics of occupations with relatively low status are likely to find many occupations with low job tenure and security. However, individuals choosing among relatively high status occupations are more likely to use tenure and security as decision criteria than individuals choosing among relatively low status occupations.

c. Environmental and Institutional Conditions of Employment. A number of authors recommended that working conditions be included in an occupational information system. Particular attention should be paid to known and suspected health hazards associated with work in an occupation. Program planners should avoid training workers in occupations where health and working conditions consistently do not meet acceptable standards. Norris (1972), Hoppock (1976), and Cassell and Rodgers (1978) also noted the importance of information on psychological working conditions. This information will be most useful to individuals who are thinking about careers in particularly stressful occupations.

Thal-Larsen (1972) also recommended the inclusion of information on the usual kind of establishment in which one works in an occupation. Here it may also be appropriate to include the names of major local employers in an occupation.

Institutional variables which were recommended for inclusion in an occupational information system are extent of unionization and existence of other occupational organizations. Fry (1979) and Hoppock (1976) also recommended the inclusion of information on legislation which is relevant to employment in particular occupations.

F. Complementary Information

A variety of needed complementary information was also identified in the literature. Additional population and labor force data was recommended for use by program planners and administrators. Individuals making vocational choice decisions would benefit from detailed information on educational alternatives and opportunities.

1. Population Data

Five distinct kinds of general population information was recommended in the literature. Planners require data on the current population in the area for which they are planning. Teeple (1971) and Thal-Larsen (1972) also recommended that population data be broken down by demographic groups. In addition, these authors recommended that population projections be included in any planning data base. This information may be particularly useful to education planners who will want to estimate the long run demand for their services. Data on educational attainment by age are required in state vocational education plans. These data can be useful to employment and training planners as well and should be included in an occupational information system. Thal-Larsen (1972) also recommended that data on income level by family and family size distributions be included in an occupation information system. This information would be particularly useful to employment and training planners in estimating the number of people eligible for CETA services. As an aid in identifying the extent of the eligible population, the U.S. Department of Labor (1974) recommended that data on the number of families receiving welfare also be included as complementary information.

2. Additional Labor Force Data

Several authors identified the need for more general labor force data than is readily available in the occupational information system outlined in this paper. For example, the U.S. Department of Labor (1974) recommended the use of data on the demographic composition of the entire labor force. The need for data on the geographic distribution of unemployment was also identified. Planners should also have access to data on the overall unemployment rate in their region. This may be the single most important piece of data for the planners, because the Federal funds which they are eligible to receive is in large part determined by the unemployment rate.

3. Data on Educational Alternatives and Opportunities

An occupational information system should also include data on the variety of education and training opportunities available in an area. Employment and training and vocational education planners require information on education programs, their curriculum content, length, and degree or certificate awarded to be familiar with the range of occupations for which individuals can be trained (U.S. Department of Labor, 1974; New England Regional Commission, 1978).

Individuals interested in preparing for an occupation also must have information about the availability of opportunities to train for entry in the occupation. Thal-Larsen (1972) recommended that training and apprenticeship opportunities be compiled by occupation. Stern (1975) recommended that educational data be included in an information system in this way as well. However, he further recommended the inclusion of additional information about the educational institutions themselves. This information would be used almost solely by individuals making educational choices.

VI. CONCLUSION

The purpose of this paper has been to review the literature related to data needs for an occupational information system. In identifying the literature to be reviewed, the position was taken that an understanding of the uses of occupational information and the theories which inform its use was a necessary background step. It would then be possible to recommend the specific data elements which should be included in an occupational information system. To accomplish this task, it was necessary to review a wide range of literature.

In general, this literature was characterized by five common approaches to a discussion of the data needs and uses of an occupational information system.

First, no single piece of literature reviewed here treats the whole array of issues related to the establishment of an occupational information system. Individual articles tend to treat only one aspect of occupational information. That is, authors tend to deal exclusively in the theoretical basis of an OIS, or in the delivery system for the information, or in the benefits which are expected to result from data use.

For example, the path-breaking and comprehensive work by Thal-Larsen (1972) focuses on data elements and their potential use by planners and counselors. However, no argument is developed regarding the need for occupational information. In addition, the need for specific data elements is not tied to any theoretical framework about the labor market or the labor market behavior of individuals. As another example, the 1978 Bureau of Labor Statistics study of occupational training information in New England provides an excellent discussion of the structural models of occupational demand and occupational supply. However, the document provides only a discussion of occupational supply data, when actual data elements are discussed.

The fact remains that the Thal-Larsen and Bureau of Labor Statistics studies are excellent and clearly fulfill the purposes for which they were intended. However, the point here is that a comprehensive document dealing with structural models, theories, implementation activities (or plans) which follow from the theoretical frameworks, and the data needed

to successfully execute the plan has not yet been developed. The field is probably some time away from the development of a comprehensive document. However, until that time it is recommended that researchers continue to contribute to the missing pieces.

Second, a component of the relatively narrow approach of individual pieces of literature is the relative absence of discussions of the relationship between theories of the labor market or vocational choice and specific data needs. The literature which deals with substantive theory simply does not deal with the range of data needs of the OIS user groups. (However, to be fair those articles which deal with the use of only one data element generally rest on the theoretical basis for the use of the data element.) Many articles which recommended a range of data elements for inclusion in an occupational information system tended to neglect substantive theory. This is especially true of the literature on data needs for vocational decisionmaking, where no work has been done to link explicitly theories of vocational decisionmaking with data needs. To some extent, the literature on vocational decisionmaking has remained so theoretical and has been subjected to so few empirical tests that it is difficult to translate the vocational decisionmaking literature into concrete data needs. For this reason it is recommended that researchers actively pursue opportunities to test the career decisionmaking theories discussed in this paper.

Some of the vocational decisionmaking literature which deals with the need for occupational information among youth or the most appropriate delivery system for vocational decisionmaking contain a discussion of needed data elements or a table of recommended data elements which is well integrated into the larger argument being made for the need for occupational information. The literature on data needs in vocational decisionmaking will be strengthened if future discussions are focused on building an argument for the need for specific data elements in the vocational decisionmaking process.

Similarly, literature on data needs in employment planning will be strengthened if arguments are built around specific labor market theories, the policy and program interventions which are appropriate within the context of these theories, and the specific data elements which are

needed to knowledgeably develop and implement these interventions. The Sum and Harrison (1978) price on labor market information requirements for research from the perspective of a segmented labor market is a major step in this direction.

Third, no recent work has appeared which attempts to bridge the occupational information needs and uses across the major user groups. For the most part the literature is directed at individuals in a single major user group. While this is a natural division, the field could benefit from cross-fertilization between the ideas of planners and administrators and guidance personnel. Indeed, the planning-oriented literature is likely to improve with an increased communication between advocates for employment and training and vocational education planners. Individuals in these user groups overlap heavily in tasks and responsibilities. And because of this the data required by each of the user groups overlaps heavily as well. It is this overlap and the implications which it has for data use and delivery which should be explicitly dealt with in the literature. In particular, it is anticipated that the increased communication between the two groups would increase the visibility of the need of both of these groups for supply/demand match data. Increased communication between the two groups would also emphasize the impacts which these two groups have on one another.

There is little explicit discussion of the relationship between the career decisionmaking process of an individual and the education and training context in which the individual must make a decision. The literature on the benefits accruing to youth as a result of their labor market knowledge (Parnes, 1975; Parnes and Kohen, 1975; and Andrisani, 1976) provides the initial foray into this relationship. It is recommended that the relationship between career decisionmaking and the labor market context in which a decision is made be explored further. In particular, it is recommended that the information about the labor market which an individual is most likely to benefit from knowing be explored empirically.

Fourth, the literature would benefit from a more detailed treatment of the use to which specific data elements will be put. Lists of recommended data elements are abundant, but an in-depth discussion of how these data elements will be used is too infrequent. A careful treatment

of the specific uses for data in planning and decisionmaking would be a convincing argument of the need for individual data elements. It is recommended that individuals working in employment and training planning, educational planning, and vocational decisionmaking specify as precisely as possible how particular data elements would be used by them in their professional duties. The documents resulting from such specific treatment of data elements would be most productively directed at the practice community to direct professionals in the use of occupational information to enhance the quality of their decisions and actions on the job.

Finally, there is relatively little detailed discussion of the full range of actual data elements which should be included in an occupational information system. The NOICC Framework document and the Thal-Larsen study are the only exceptions of which this author is aware. Thus, it is necessary to review a wide range of literature to search for data elements that are recommended for inclusion in an OIS in the literature. However, there is an abundance of literature which treats groups of data elements or individual pieces of occupational information. When this literature is treated as a body, it is possible to view the range of data elements which are likely to be included in an occupational information system. The overall purpose of this paper has been to synthesize that literature and to elicit from it recommendations for the purpose, structure, and contents of an occupational information system.

BIBLIOGRAPHY

Ahamad, Bashir and Blaug, Mark. "Introduction." The Practice of Manpower Forecasting: A Collection of Case Studies. Edited by Bashir Ahamad and Mark Blaug. San Francisco: Jossey-Bass Inc., 1973.

Andrisani, Paul. "The Establishment of Stable and Successful Employment Careers: The Role of Work Attitudes and Labor Market Knowledge." Conference Report on Youth Unemployment: Its Measurement and Meaning. Washington, D.C.: U.S. Department of Labor, Employment and Training Administration, 1978.

Barton, Paul E. and Fraser, Bryna Shore. Between Two Worlds: Youth Transition from School to Work. Volumes 1 and 2. Washington, D.C.: National Manpower Institute, Center for Education and Work, 1978.

Cain, Glen G. "The Challenge of Segmented Labor Market Theories to Orthodox Theories." Journal of Economic Literature. V. 14, 1215-1258, December, 1976.

Cassell, Frank and Rodgers, Ronald. "The Public Employment Service as a Labor Market Intermediary." Labor Market Intermediaries. A Special Report of the National Commission for Manpower Policy. Report No. 22. Washington, D.C.: U.S. Government Printing Office, 1978.

Center for Vocational and Technical Education. Establishment of a Comprehensive Data System for Occupational Training in Kentucky-Phase I, Final Report. Columbus: Ohio State University, Center for Vocational and Technical Education, 1972.

Copa, George H. and Ervin, Donald E. Occupational Supply and Demand Information: A Format With Implications for Planning Education for Work. Minneapolis: University of Minnesota, Research Coordinating Unit for Vocational Education, 1974.

Datta, Lois-ellin. "Improved Labor Market Information and Career Choice: Issues in Program Evaluation." Labor Market Information for Youths. Edited by Seymour Wolfbein. Philadelphia: Temple University, School of Business Administration, 1975.

Doeringer, Peter B. and Piore, Michael J. Internal Labor Markets and Manpower Analysis. Lexington: Heath Lexington Books, 1971.

Drewes, D.W. and Katz, D.W. Manpower Data and Vocational Education: A National Study of Availability and Use. Raleigh, N.C.: North Carolina State University, Center for Occupational Education, 1975.

Edwards, Richard, Reich, Michael, and Gordon, David (Editors). Labor Market Segmentation. Lexington: D.C. Heath and Co., 1975.

Ehrle, R. "Vocational Planning Information Available to Employment Service Counselors." Vocational Guidance Quarterly. (Winter, 1964-65), 91-94.

Flanders, Russell. "Occupational Data: The Foundation of a Labor Market Information System." Labor Market Information for Youths. Edited by Seymour Wolfbein. Philadelphia: Temple University, School of Business Administration, 1975.

Frumerman, H. Job Vacancy Statistics in the United States. National Commission on Employment and Unemployment Statistics, Background Paper No. 3. Washington, D.C.: U.S. Government Printing Office, 1978.

Fry, Ronald. "Occupational Information in Vocational Evaluation." Unpublished manuscript, 1979.

Ginzberg, Eli. "Toward a Theory of Occupational Choice: A Restatement." Vocational Guidance Quarterly, 1972, 169-175.

Gordon, David M. Theories of Poverty and Underemployment: Orthodox, Radical, and Dual Labor Market Perspectives. Lexington, Mass.: D.C. Heath and Company, 1972.

Gottfredson, Linda and Brown, V. "Holland Codes for the 1960 and 1970 Census Detailed Occupational Titles." JSAS Catalog of Selected Documents in Psychology, 1979.

Hargrave, Benjamin. "The California Experience." Labor Market Information for Youths. Edited by Seymour Wolfbein. Philadelphia: Temple University, School of Business Administration, 1975.

Herr, Edwin. "Role of Occupational Information System in Career Guidance and Counseling." Paper commissioned by the National Occupational Information Coordinating Committee, 1980.

Herr, Edwin and Cramer, Stanley. Career Guidance through the Life Span: Systematic Approaches. Boston: Little, Brown and Company, 1979.

Holden, Robert, et al. Final Report on the Development of a Labor Market Information and Job Training Skills Development Program. Philadelphia, Pennsylvania: Universal Systems Development, Inc., 1978.

Holland, John. "Vocational Preferences." Handbook of Industrial and Organizational Psychology. Edited by Marvin Dunnette. Chicago: Rand McNally College Publishing Co., 1976.

Holland, John, and Gottfredson, Gary. "Using a Typology of Persons and Environments to Explain Careers: Some Extensions and Clarifications." The Counseling Psychologist, 6, (1976), 20-29.

Hoppock, Robert. Occupational Information: Where to Get It and How to Use in Career Education, Career Counseling, and Career Development. Fourth Edition. New York: McGraw Hill, 1976.

Hoyt, Kenneth B., Evans, Rupert N., Mackin, Edward F., and Mangum, Garth. Career Education: What It is and How to Do It. Second Edition. Salt Lake City: Olympus Publishing Co., 1974.

Isaacson, Lee. Career Information in Counseling and Teaching. Boston: Allyn and Bacon, Inc., 1973.

Kalachek, E. "Longitudinal labor market surveys: Asking 'how come', not 'how many'." Monthly Labor Review. (101), 1978, 8-14.

Lawrence, John E.S. and McAdams, Katherine. Vocational Development Theory and the National Longitudinal Study. Research Triangle Park, N.C.: Research Triangle Institute, 1978.

Lawson, Rodger. Perspectives on the Development of a Comprehensive Labor Market Information System for Michigan. Methods for Manpower Analysis No. 6. Kalamazoo: W.E. Upjohn Institute for Employment Research, 1973.

LeCam,Christine. The Role of Institutional Supply Data in the Development of an Occupational Information System. Paper presented at the Seventh Annual New England Business and Economics Conference. Boston: Massachusetts Department of Manpower Development, Research and Program Development Division, 1979.

LeCam, C., and Sum, A. A Description of the Methodologies and Data Sources Used in Constructing the Preliminary Occupational Demand-Supply Table for the State of Massachusetts. Boston: Massachusetts Department of Manpower Development, Research and Program Development Division, 1978.

Lecht, Leonard. Evaluating Vocational Education Policies and Plans for the 1970's. New York: Praeger, 1974.

Lecht, Leonard. Occupational Choices and Training Needs: Prospects for the 1980's. New York: Praeger, 1977.

Lecht, Leonard. Occupational Projections for National, State and Local Areas. National Commission on Employment and Unemployment Statistics, Background Paper No. 20. Washington, D.C.: U.S. Government Printing Office, 1978.

Levine, Louis. Labor Market Information for the Local Delivery of Manpower Services. Report prepared for the U.S. Department of Labor, Manpower Administration, 1972.

McKinlay, Bruce. Developing a Career Information System. Eugene, Oregon: University of Oregon, Career Information System, 1974.

McKinlay, Bruce and Franklin, Paul. Education Components for a Career Information System. Eugene, Oregon: University of Oregon, Career Information System, 1975.

Mangum, Garth L. Employment and Unemployment Statistics and the CETA Prime Sponsor. National Commission on Employment and Unemployment Statistics, Background Paper No. 7. Washington, D.C.: U.S. Government Printing Office, 1978.

Mangum, Garth, Morlock, J., Pines, M., and Snedeker, D. Job Market Futurity: Planning and Managing Local Manpower Programs. Salt Lake City: Olympus Publishing Co., 1979.

Moore G. Improving the Presentation of Employment and Unemployment Statistics. National Commission on Employment and Unemployment Statistics, Background Paper No. 22. Washington, D.C.: U.S. Government Printing Office, 1978.

National Commission on Employment and Unemployment Statistics. Counting the Labor Force. Washington, D.C.: U.S. Government Printing Office, 1979.

Norris, Willa, et al. The Information Service in Guidance: For Career Development and Planning. Third Edition. Chicago: Rand McNally and Co., 1972.

Osipow, Samuel. "The Relevance of Theories of Career Development to Typical Groups: Problems, Needed Data, and Implications." Career Behavior of Typical Groups: Theory, Research and Practice. Columbus, Ohio: Charles E. Merrill Publishing Co., 1975.

Parnes, Herbert. "Improved Job Information: Its Impact on Long-Run Labor Market Experience." Labor Market Information for Youth. Edited by Seymour Wolfbein. Philadelphia: Temple University, School of Business Administration, 1975.

Parnes, Herbert and Kohen, Andrew. "Occupational Information and Labor Market Status: The Case of Young Men." Journal of Human Resources, 10, (1975), 44-55.

Pearce, Charles A. "Occupational Components for Labor Market Information in State Employment Security Agencies." Labor Research Report No. 23. New York: New York State Department of Labor, Division of Research and Statistics, 1975.

Piore, Michael. "The Dual Labor Market: Theory and Implications." Problems in Political Economy: An Urban Perspective, Edited by David Gordon, Lexington: D.C. Heath and Co., 1971.

Rodgers, Ronald. Educational Planning in the Labor Market: Linking Occupational Education to Regional Economic Development. Evanston, Ill.: Northwestern University Graduate of Management and School of Education, 1976.

Shea, John. "Occupational Education and Training Requirements: Relationships Essential for Planning State Vocational Education." Manpower Information for Vocational Education Planning. Edited by Robert C. Young. Columbus: Ohio State University, Center for Vocational and Technical Education, 1969.

Smith, Ralph, and Vanski, Jean. Gross Change Data: The Neglected Data Base. National Commission on Employment and Unemployment Statistics, Background Paper No. 11. Washington, D.C.: U.S. Government Printing Office, 1978.

Sommers, Dixie. "Occupational Supply Information and Planning for Education and Training." Paper presented at the North American Conference on Labor Statistics, Ottowa, Canada. July 26, 1976.

Stern, Barry. "Application of Information Systems to Career and Job Choice." Labor Market Information for Youths. Edited by Seymour Wolfbein. Philadelphia: Temple University, School of Business Administration, 1975.

Stevens, David. An Experimental Labor Market Information Program to Encourage Self-Initiated Job Search by Selected Registrants with Public Employment Service Offices. Washington, D.C.: U.S. Department of Labor, Manpower Administration, 1972.

Stevens, David. "Employment Projections for Planning Vocational Technical Education Curricula: Mission Impossible." Unpublished paper. Columbia: University of Missouri, Human Resources Research Program, 1976.

Stevenson, Wayne. "Transition from School to Work." The Lingering Crisis of Youth Unemployment. Edited by Arvil Adams and Garth Mangum. Kalamazoo: N.E. Upjohn Institute for Employment Research, 1978.

Strickland, Norma. "Labor Market Data for Vocational Education Program Planning." Florida Vocational Journal, January-February, 1977, 14-19.

Sum, Andrew and Harrison, Bennett. "Labor Market Information Data Requirements from the Perspective of 'Dual' or 'Segmented' Labor Market Research." Boston: Department of Manpower Development, Research and Program Development Division, 1978.

Sum, Andrew, Sawhney, P., and Herrnstadt, I. "Issues in the Development of a Comprehensive Occupational Information System for the Commonwealth of Massachusetts." Boston: Department of Manpower Development, Research and Program Development Division, 1977.

Sum, Andrew, Sawhney, P., and Mazzeo, K. "An Introduction to the Role of Occupational Information Systems: The Objectives of the Labor Supply Study." Boston: Massachusetts Department of Manpower Development, Research and Program Development Division, 1978.

Super, D. and Hall, D. Career Development: Exploration and Planning. Annual Review of Psychology, 29, (1978), 333-372.

Teeple, John, et al. An Analysis of Manpower Requirements Information and the Availability of Vocational Education in Selected Urban and Rural areas. Washington, D.C.: National Planning Association, 1971.

Thal, Margaret Larsen, Laner, S., and Mayall, D. Requirements and Design of a Labor Market Information System for a Large Metropolitan Area. Berkeley: University of California, Human Factors in Technology Research Group, 1972.

Tweeten, Luther. Rural Employment and Unemployment Statistics. National Commission on Employment and Unemployment Statistics, Background Paper No. 4. Washington, D.C.: U.S. Government Printing Office, 1978.

U.S. Department of Labor, Bureau of Labor Statistics. Occupational Employment Statistics Handbook. Washington, D.C.: U.S. Government Printing Office, April 1979.

U.S. Department of Labor, Bureau of Labor Statistics. Occupational Supply: Concepts and Sources of Data for Manpower Analysis, Bureau of Labor Statistics Bulletin 1816. Washington, D.C.: U.S. Government Printing Office, 1974a.

U.S. Department of Labor, Bureau of Labor Statistics. Occupational Training Information in New England: An Evaluation, Volumes 1 and 2. Report to the New England Regional Commission. Boston: The New England Regional Commission, 1978.

U.S. Department of Labor, Manpower Administration. Manpower Program Planning Guide. Washington, D.C.: U.S. Government Printing Office, 1974b.

U.S. Department of Labor, Employment and Training Administration. Guide for Occupational Exploration. Washington, D.C.: U.S. Government Printing Office, 1979.

Viernstein, M.C. "The Extension of Holland's Occupational Classification to All Occupations in the Dictionary of Occupational Titles." Baltimore: Center for Social Organization of Schools, Johns Hopkins University, April 1971.

Weick, Jerry. Occupational Information for ES (Employment Service) Counseling: An Evaluation of Occupational Information Access Pilot Usage in Three Portland Employment Division Offices. Eugene: University of Oregon, 1972.

Wolfbein, S. Establishment Reporting in the United States. National Commission on Employment and Unemployment Statistics, Background Paper No. 2. Washington, D.C.: U.S. Government Printing Office, 1978.

Wool, Harold. "The Adequacy of Occupational Data on Employed and Unemployed Workers for Analyzing Labor Market Behavior." National Commission on Employment and Unemployment Statistics, Background Paper No. 18. Washington, D.C.: U.S. Government Printing Office, 1979.

Yavitz, Boris and Morse, Dean with Dutka, Anna. The Labor Market: An Information System. New York: Praeger Publishers, 1973.

Young, K. An Assessment of the Decisionmaking Data Needs of State Economic Development and Planning Officials. Washington, D.C.: National Governor's Association, Center for Policy Research, 1979.

APPENDIX A

Author Recommendations for Data Elements for an Occupational Information System

I. COMPONENT ONE: OCCUPATIONAL DEMAND

A. Data Element: Current Employment

Policy, Planning, and Administration Literature	Guidance Literature
1972 Thal-Larsen By demographic group	1965 Ehrle
1973 Lawson Yavitz and Morse	1972 Levine Norris Flanders
1974 Copa and Irvin U.S. Department of Labor, Bureau of Labor Statistics U.S. Department of Labor, Manpower Administration By demographic group	1975 Stern By demographic group
Drewes and Katz	1976 Hoppock
1975 Hargrave	1978 Holden
1977 Sum, Sawhney, and Herrnstadt	
1978 Lecht By demographic group Sum, Sawhney, and Mazzeo	
1979 LeCam Young	

B. Data Element: Current Job Openings

Policy, Planning, and Administration Literature	Guidance Literature
1971 Teeple	1972 Levine
1972 Thal-Larsen By establishment	1978 Holden
1973 Lawson	
1974 Lecht	
1977 Lecht	
1978 Frumerman Mangum Sum, Sawhney, and Mazzeo	
1979 Wool	

C. Data Element: Projected Occupational Demand, Including Expansion/Reduction and Replacement Demand

Policy, Planning, and Administration Literature	Guidance Literature
1971 Teeple	1965 Ehrle
1972 Center for Vocational and Technical Education Thal-Larsen	1972 Levine
1973 Ahamad and Blaug Lawson	1975 Flanders
1974 Copa and Irvin Lecht Drewes and Katz	1976 Hoppock
1975 Hargrave	1978 Barton and Fraser Holden
1976 Rodgers	
1977 Sum, Sawhney, and Herrnstadt LeCam and Sum Lecht By demographic group	
1978 Mangum Sum, Sawhney, and Mazzeo	
1979 LeCam	

D. Data Element: Employment by Industry

Policy, Planning, and Administration Literature	Guidance Literature
1971 Teeple	1965 Ehrle
1972 Thal-Larsen Also projections	1972 Levine
1973 Lawson	1975 Stern
1974 U.S. Department of Labor, Manpower Administration Also projections	
1978 Mangum	
1979 National Commission on Employment and Unemployment Statistics	

II. COMPONENT TWO: OCCUPATIONAL SUPPLY

A. Data Element: Currently Unemployed

Policy, Planning, and Administration Literature	Guidance Literature
1971 Teeple By demographic group	1965 Ehrle By demographic group
1972 Thal-Larsen	1972 Levine By demographic group
1973 Lawson Yavitz and Morse	1975 Stern
1974 Copa and Irvin U.S. Department of Labor, Bureau of Labor Statistics U.S. Department of Labor, Manpower Administration By demographic group	1978 Barton and Fraser Holden
1979 National Commission on Employment and Unemployment Statistics Wool	

B. Data Element: Occupational Suppy Projections

Policy, Planning, and Administration Literature	Guidance Literature
1971 Teeple	
1972 Thal-Larsen	
1973 Lawson	
1974 Lecht	
1978 Lecht Sum, Sawhney, and Mazzeo	

C. Data Element: Vocational Education Enrollment

Policy, Planning, and Administration Literature	Guidance Literature
1971 Teeple By demographic group	1975 Stern By demographic group
1972 Center for Vocational and Technical Education By demographic group Thal-Larsen	
1973 Lawson	
1974 Copa and Irvin U.S. Department of Labor Bureau of Labor Statistics Drewes and Katz	
1975 Hargrave	
1978 LeCam and Sum Mangum U.S. Department of Labor, Bureau of Labor Statistics By demographic group	
1979 LeCam	

D. Data Element: Vocational Education Completion Data

Policy, Planning, and Administration Literature	Guidance Literature
1971 Teeple By demographic group	1975 Stern By demographic group
1974 Copa and Irvin Lecht U.S. Department of Labor, Bureau of Labor Statistics	
1976 Sommers	
1977 Lecht Sum, Sawhney, and Mazzeo	
1978 Lecht LeCam and Sum Mangum	
1979 LeCam	

E. Data Element: Vocational Education Follow-up Data

Policy, Planning, and Administration Literature	Guidance Literature
1971 Teeple By demographic group	1975 Stern By demographic group
1972 Center for Vocational and Technical Education	
1974 Copa and Irvin U.S. Department of Labor, Bureau of Labor Statistics	
1976 Sommers	
1977 Sum, Sawhney, and Herrnstadt	
1978 Sum, Sawhney, and Mazzeo U.S. Department of Labor, Bureau of Labor Statistics	
1979 LeCam National Commission on Employment and Unemployment Statistics	

F. Data Element: Educational and Training Enrollment, Completion, and Followup Not Including Vocational Education

Policy, Planning, and Administration Literature	Guidance Literature
1969 Shea	1972 Levine Manpower programs By demographic group
1971 Teeple Data on all sources By demographic group	
1972 Thal-Larsen	
1974 U.S. Department of Labor, Bureau of Labor Statistics Data on all sources	
1975 Hargrave	
1976 Sommers Data on all sources	
1977 Sum, Sawhney, and Herrnstadt LeCam and Sum	
1978 Manqum U.S. Department of Labor, Bureau of Labor Statistics Data on all sources	
1979 LeCam Data on all sources	

G. Data Elements: Occupational Transfers

Policy, Planning, and Administration Literature	Guidance Literature
1973 Lawson Yavitz and Morris	1972 Levine
1974 Copa and Irvin U.S. Department of Labor, Bureau of Labor Statistics	1975 Stern
1975 Hargrave	
1976 Sommers	
1977 Sum, Sawhney and Herrnstadt	
1978 Kalachek Smith and Vanski	
1979 National Commission on Employment and Unemployment Statistics Wood	

H. Data Element: Labor Force Entrants/Re-entrants, Including Gross Flow Data

Policy, Planning, and Administration Literature	Guidance Literature
1973 Lawson Yavitz and Morris	1965 Ehrle
1974 U.S. Department of Labor, Bureau of Labor Statistics	1972 Levine
1975 Hargrave	1975 Stern
1976 Sommers	
1977 Sum, Sawhney, and Herrnstadt	
1978 Kalachek By demographic group	

I. Data Element: Labor Market Migration

Policy, Planning, and Administration Literature	Guidance Literature
1972 Thal-Larsen	1975 Stern
1974 Copa and Irvin U.S. Department of Labor, Bureau of Labor Statistics Drewes and Katz	
1975 Hargrave	
1976 Sommers	
1977 Sum, Sawhney, and Herrnstadt	
1979 National Commission on Employment and Unemployment Statistics	

III. COMPONENT THREE: SUPPLY/DEMAND ANALYSIS

A. Data Element: Demand/Supply Indicators

Policy, Planning, and Administration Literature	Guidance Literature
1972 Thal-Larsen	1978 Holden
1973 Lawson	1979 Fry
1974 Copa and Irvin U.S. Department of Labor, Bureau of Labor Statistics	
1975 Drewes and Katz	
1977 Sum, Sawhney, and Herrnstadt	
1978 LeCam and Sum Sum, Sawhney, and Mazzeo U.S. Department of Labor, Bureau of Labor Statistics	
1979 LeCam	

IV. COMPONENT FOUR: OCCUPATIONAL CHARACTERISTICS

A. Data Element: Job Duties

Policy, Planning, and Administration Literature	Guidance Literature
1969 Shea	1965 Ehrle
1972 Thal-Larsen	1975 Flanders Parnes Stern
1973 Lawson	1976 Hoppock
1974 U.S. Department of Labor, Bureau of Labor Statistics Particular emphasis on skill content and requirements	1978 Barton and Fraser
1978 Mangum	1979 Fry

B. Data Element: Occupational Requirements

Policy, Planning, and Administration Literature	Guidance Literature
1969 Shea	1965 Ehrle
1972 Thal-Larsen	1972 Levine Norris
1974 U.S. Department of Labor, Bureau of Labor Statistics U.S. Department of Labor, Manpower Administration Drewes and Katz	1975 Flanders Parnes Stern
1975 Hargrave	1976 Hoppock
1976 Rodgers	1978 Holden Stevenson
1977 Sum, Sawhney, and Herrnstadt	1979 Barton and Fraser Fry
1978 Cassell and Rodgers Mangum Sum, Sawhney, and Mazzeo	

C. Data Element: Licensing, Certification, Registration Information

Policy, Planning, and Administration Literature	Guidance Literature
1972 Thal-Larsen	1965 Ehrle
1973 Lawson	1975 Flanders Stern
1974 U.S. Department of Labor, Bureau of Labor Statistics	1979 Fry

D. Data Element: Hiring Channels/Entry Methods, Including Job Search Techniques

Policy, Planning, and Administration Literature	Guidance Literature
1972 Thal-Larsen	1965 Ehrle
1973 Lawson	1972 Levine Norris
1974 U.S. Department of Labor, Bureau of Labor Statistics	1975 Parnes Stern
1977 Sum, Sawhney, and Herrnstadt	1976 Hoppock
1978 Sum, Sawhney, and Mazzeo	1978 Barton and Fraser Holden
	1979 Fry

E. Data Elements: Entry Barriers, Including Citizenship, Handicapped Status, Veteran, Sex, Race, Height

Policy, Planning, and Administration Literature	Guidance Literature
1970 Shea	1965 Ehrle
1972 Thal-Larsen By establishment	1972 Norris Special reference to handicapped status
1976 Rodgers	1976 Hoppock
	1979 Fry Special reference to handicapped status

F. Data Elements: Career Ladders, Including Ports of Entry

Policy, Planning, and Administration Literature	Guidance Literature
1969 Shea	1965 Ehrle
1972 Thal-Larsen	1972 Levine Norris
1975 Drewes and Katz	1975 Stern
1976 Rodgers Skills transferance	1976 Cassell and Rodgers Hoppock
1977 Sum, Sawhney, and Herrnstadt	1978 Holden
1978 Lecht Sum, Sawhney, and Mazzeo	1979 Fry

G. Data Elements: Earnings

Policy, Planning, and Administration Literature	Guidance Literature
1972 Thal-Larsen	1965 Ehrle
1973 Yavitz and Morris	1972 Levine Norris
1974 U.S. Department of Labor, Bureau of Labor Statistics U.S. Department of Labor, Manpower Administration	1975 Flanders Parnes Sterns
1976 Rodgers	1976 Hoppock
1977 Lecht Sum, Sawhney, and Herrnstadt	1978 Cassell and Rodgers Stevenson
1978 Lecht Mangum Sum, Sawhney, and Mazzeo	
1979 National Commission on Employment and Unemployment Statistics	

H. Data Element: Benefits

Policy, Planning, and Administration Literature	Guidance Literature
1972 Thal-Larsen	1972 Norris
1976 Rodgers	1975 Flanders
1978 Cassell and Rodgers	Parnes
Sum, Sawhney, and Mazzeo	Stern

I. Data Element: Hours Worked

Policy, Planning, and Administration Literature	Guidance Literature
1972 Thal-Larsen	1965 Ehrle
1973 Yavitz and Morris	1972 Norris

J. Data Element: Seasonality/Regularity of Employment

Policy, Planning, and Administration Literature	Guidance Literature
	1965 Ehrle
	1972 Norris

K. Data Element: Job Tenure

Policy, Planning, and Administration Literature	Guidance Literature
1972 Thal-Larsen	
1978 Lecht	
Job security	

L. Data Element: Working Conditions

Policy, Planning, and Administration Literature	Guidance Literature
1972 Thal-Larsen	1965 Ehrle
1978 Mangum Sum, Sawhney, and Mazzeo	1972 Levine Norris Also psychological conditions
	1976 Hoppock Also psychological conditions
	1978 Cassell and Rodgers Also psychological conditions
	1979 Fry

M. Data Element: Nature of Establishment

Policy, Planning, and Administration Literature	Guidance Literature
1972 Thal-Larsen	
1973 Lawson	

N. Data Element: Occupational Organizations

Policy, Planning, and Administration Literature	Guidance Literature
1972 Thal-Larsen	1972 Norris
1973 Lawson	1976 Hoppock
	1979 Fry

O. Data Element: Pertinent Legislation

Policy, Planning, and Administration Literature	Guidance Literature
	1972 Norris
	1976 Hoppock
	1979 Fry

V. COMPONENT FIVE: COMPLEMENTARY INFORMATION

A. Data Element: Current Population

Policy, Planning, and Administration Literature	Guidance Literature
1971 Teeple By demographic group	1975 Stern By demographic group
1972 Thal-Larsen By demographic group	
1973 Lawson By demographic group	
1975 Hargrave By demographic group	
1978 Mangum By demographic group	

B. Data Element: Educational Attainment of Population

Policy, Planning, and Administration Literature	Guidance Literature
1972 Thal-Larsen	1975 Stern
1975 Hargrave	

C. Data Element: Family Income

Policy, Planning, and Administration Literature	Guidance Literature
1972 Thal-Larsen By family size	1975 Stern
1975 Hargrave	
1978 Mangum By demographic group	

D. Data Element: Households Receiving Welfare

Policy, Planning, and Administration Literature	Guidance Literature
1974 U.S. Department of Labor, Manpower Administration	1975 Stern

E. Data Element: Current Labor Force

Policy, Planning, and Administration Literature	Guidance Literature
1971 Teeple	1965 Ehrle By demographic group
1972 Thal-Larsen	1975 Stern By demographic group
1973 Lawson	1978 Holden By demographic group
1974 Copa and Irvin U.S. Department of Labor, Manpower Administration By demographic group	

F. Data Element: Current Labor Force Unemployment

Policy, Planning, and Administration Literature	Guidance Literature
1974 Copa and Irvin	
1975 Drewes and Katz By geographic distribution	
1978 Kalachek By demographic group Mangum	

G. Data Element: Educational and Training Opportunities

Policy, Planning, and Administration Literature	Guidance Literature
1972 Thal-Larsen	1975 Stern
1974 U.S. Department of Labor, Bureau of Labor Statistics	1978 Barton and Fraser
1975 Hargrave	
1978 New England Regional Commission	
1979 LeCam National Commission on Employment and Unemployment Statistics	

APPENDIX B

Annotated Bibliography

Ahamad, Bashir and Blaug, Mark. "Introduction." The Practice of Manpower Forecasting: A Collection of Case Studies. Edited by Bashir Ahamad and Mark Blaug. San Francisco: Jossey-Bass Inc., 1973.

The purpose of this book is to evaluate the national manpower forecasts used for educational planning. The practice of manpower forecasting in several developed nations is reviewed in a series of case study type articles. In their introductory chapter, Ahamad and Blaug briefly review the need for manpower forecasts. In addition to specifying a structural model for the calculation of manpower needs, the authors provide a brief discussion of the uses of estimates of manpower requirements and availabilities in the policymaking agenda. Particular attention is paid to the use of estimates in educational planning.

Andrisani, Paul. "The Establishment of Stable and Successful Employment Careers: The Role of Work Attitudes and Labor Market Knowledge." Conference Report on Youth Unemployment: It's Measurement and Meaning. Washington, D.C.: U.S. Department of Labor, Employment and Training Administration, 1978.

This paper assesses the extent to which stable and successful employment careers are a function of the work attitudes and labor market knowledge of youth. Data from the National Longitudinal Surveys indicate the importance of positive work attitudes and adequate labor market knowledge for the establishment of stable and successful employment careers. Although Andrisani notes the severe inadequacy of all types of labor market knowledge among youth, he concludes that inadequate knowledge is not responsible for the worsening youth labor market situation. Rather, he concludes that loose labor markets have lead to a deterioration of positive work attitudes among youth which in turn increases the difficulty in establishing stable and successful employment careers. Andrisani concludes with two public policy recommendations. First, youth should be exposed to increased labor market information. Second, employment and training programs should seek to offset the negative, anti-work effects of loose labor markets, particularly the youth labor market, on the work attitudes of youth.

Barton, Paul E. and Fraser, Bryna Shore. Between Two Worlds: Youth Transition from School to Work. Volumes 1, 2, and 3. Washington, D.C.: National Manpower Institute, Center for Education and Work, 1978.

This three-volume study provides a synthesis of existing knowledge and a strategy for new research and experimentation in the transition from school to work. It is an excellent review of the literature and assessment of current knowledge in the field. The first volume addresses the problems, conditions, and policy issues relating to the transition. The second volume provides an extensive summary of evaluations of programs designed to facilitate the transition from school to work. In the final volume the authors recommend a new research and experimentation strategy to increase policymakers' understanding of the key variables in the transition process.

Cassell, Frank and Rodgers, Ronald. "The Public Employment Service as a Labor Market Intermediary." Labor Market Intermediaries. A Special Report of the National Commission for Manpower Policy, Report No. 22. Washington, D.C.: U.S. Government Printing Office, 1978.

In this article Cassell and Rodgers discuss the public employment service as a labor market intermediary. As instruments of employment policy, labor market intermediaries help workers and employers use information to make better informed choices about a wider range of employment-related opportunities. Labor market intermediaries should facilitate labor market transitions and improve the efficiency of labor market operations. The authors discuss a variety of factors which influence intermediaries in performing their functions. The four factors are: (1) general economic conditions, (2) the political climate which defines how and where intermediary functions should be performed, (3) the changing concept of full employment, and (4) the population which must be served and the ways in which their needs can best be met. In addition, the authors provide a listing of the major criteria which job seekers and employers should use in making employment decisions.

Center for Vocational and Technical Education. Establishment of a Comprehensive Data System for Occupational Training in Kentucky-Phase I, Final Report. Columbus: Ohio State University, Center for Vocational and Technical Education, 1972.

This document reports on the first of a three-phase plan to install a state vocational education comprehensive data system for occupational training. The bulk of the document discusses the process and methodology developed for the follow-up of vocational education students. However, all elements which were to be included in the Management Information System for Vocational Education (MISVE) are discussed briefly. The data which are recommended for inclusion are manpower supply data (primarily data on vocational education enrollments), manpower demand data (from ES and student follow-up), data on the training needs of the unemployed and underemployed, as well as data on program characteristics and costs.

Copa, George H. and Ervin, Donald E. Occupational Supply and Demand Information: A Format with Implications for Planning Education for Work. Minneapolis: University of Minnesota, Research Coordinating Unit for Vocational Education, 1974.

Copa and Irvin argue that planners of education for work programs generally make changes at the margins of programs, and, therefore, information on changes in the supply and demand of labor is particularly relevant. To meet this need for change data, Copa and Irvin developed a series of flow charts tracing the movements of individuals through the educational system, individuals through possible labor market status, and workers through occupations. With these flow charts a planner is able to calculate marginal changes in occupational supply and demand which can be used in education planning.

Datta, Lois-ellin. "Improved Labor Market Information and Career Choice: Issues in Program Evaluation." Labor Market Information for Youths. Edited by Seymour Wolfbein. Philadelphia: Temple University, School of Business Administration, 1975.

Datta discusses four barriers to the evaluation of the use of labor market information in career choice decisions. First, she notes the lack of a theoretical framework explaining the career choice process. Second, the lack of research describing the extent of problems involved

with the use of labor market information prohibits further evaluative research. Third, acceptable impact measures of successful "career choice" have not been adopted in the research community. Four, no models have been delineated explaining the process by which labor market information affects an individual's career choice. Datta concludes with several broad recommendations for future research approaches to strengthen knowledge of the link between occupational information and vocational choice.

Drewes, D.W. and Katz, D.S. Manpower Data and Vocational Education: A National Study of Use and Availability. Raleigh, NC: North Carolina State University, Center for Occupational Education, 1975.

This study is based on a series of interviews with vocational education administrators, Employment Security personnel, and manpower officials at regional, state, and local levels in ten states. Respondents were asked to describe the availability and use of manpower data in vocational education planning and administration as well as to discuss the factors which affected the data's availability and use.

The authors found a lack of knowledge among vocational education administrators of the variety of manpower data that was available to them. However, the program planners and administrators felt the data of which they were aware was not suitable for their purposes. They felt the data was not suitable for the following reasons: (1) it did not have the geographic coverage required by the educational system; (2) it was often outdated, and (3) the occupational categories were either nonexistent or inappropriate for transposition to skill training required. Manpower projection data were not used to initiate new programs nor was it used as evidence for program termination. None of the ten states required local educational agencies to use specific data sources to determine local manpower needs.

The authors offered a set of recommendations for consideration to Congress, the Commissioners of Education, the Commissioner of Labor Statistics, and the Assistant Secretary of Labor for Manpower. These recommendations emphasized the need for making manpower data and its dissemination more usable, accessible, and appropriate for planning needs. They also emphasized the need for greater coordination between

vocational education and manpower planners and administrators. Of greatest importance to an occupational information system was the recommendation that a Manpower Information Coordinating Committee, consisting of the Commissioner of Education, the Commissioner of Labor Statistics, and the Assistant Secretary of Labor for Manpower be established.

Ehrle, Raymond. "Vocational Planning Information Available to Employment Service Counselors." Vocational Guidance Quarterly. (Winter, 1964-65), 91-94.

Ehrle describes the purpose of counseling as promoting intelligent vocational choice. To this end, occupational and labor market information must be provided to job seekers. Ehrle argues that occupational information is characterized by an emphasis on the individual on the job, while labor market information is characterized by an emphasis on labor market information. Included in the article is a set of data elements which are expected to be of most use to the individual in making vocational choices.

Flanders, Russell. "Occupational Data: The Foundation of a Labor Market Information System." Labor Market Information for Youths. Edited by Seymour Wolfbein. Philadelphia: Temple University, School of Business Administration, 1975.

In this article, Flanders discusses four major Bureau of Labor Statistics data collection and dissemination programs - the Occupational Outlook Handbook, the Occupational Employment Survey, the National/State Industry-Occupation matrix system, and the State-Area Occupational Manpower Projections Research Program. The purposes, uses, and major data elements of each of these programs are discussed. The relevance of this data in the development of youth's occupational and labor market knowledge is highlighted.

Frumerman, H. Job Vacancy Statistics in the United States. National Commission on Employment and Unemployment Statistics, Background Paper No. 3. Washington, D.C.: U.S. Government Printing Office, 1978.

This background paper discusses federal experience with the collection of job vacancy statistics. It also discusses issues which must be resolved before initiating a new job vacancy statistics program. No job vacancy statistics have been collected in this country since 1973. At

this time the Bureau of Labor Statistics' JOLT program was terminated, because it was not serving the needs of the two major users groups - the Employment Security offices and the research and policymaking community. The need to preserve anonymity of responding employers and the lack of timeliness of the data made it inappropriate to use in direct job placements activities, and the uneven quality of the data made it questionable for research use. After discussing both domestic and foreign experience in the collection of job vacancy statistics, Frumerman raises a variety of issues which must be resolved before a decision is made to resume collection of job vacancy. The most important of these are issues of conceptual definition and measurement and questions of industrial, occupational, and geographic detail. Frumerman is a strong advocate of the need for job vacancy statistics. He discusses their most important uses as: (1) contributing to business cycle analysis, (2) helping to determine whether the cause of unemployment lies in deficiencies in aggregate demand or inappropriate skill matches, and (3) measuring the efficiency of labor markets, and (4) identifying emerging labor shortages.

Fry, Arnold. "Occupational Information in Vocational Evaluation." Unpublished manuscript, 1979.

The purpose of this paper is to encourage vocational guidance counselors to think about the importance of providing clients with occupational information. After adopting a definition of occupational information, Fry discusses the importance of the use of occupational information in the vocational choice process and suggests ways of introducing it in the decisionmaking process. Fry argues that occupational information is an excellent complement to "hands-on" experience when choosing a vocation, and following Hoppock (1976) he suggested a list of 16 job characteristics which are useful to the client in making a career choice. The major thrust of the paper deals with occupational information media and materials. In the last half of the paper Fry provides information on how to find out about occupational information media, suggests ways for classifying the information, and provides a list of suggested materials for initial acquisition.

Ginzberg, E. "Toward a Theory of Occupational Choice: A Restatement." Guidance Quarterly, 1972, 169-175.

In this article Ginzberg offers a revision of his 1951 theory of vocational development. In the original formulation Ginzberg argued that vocational choice was a discrete decisionmaking process in which some decisions were irreversible. He further argued that the process often ended in compromise. After expanding the research sample on which his original formulation was based, Ginzberg concluded: "Occupational choice is a lifelong process of decisionmaking in which the individual seeks to find the optimal fit between his career preparation and goals and the realities of the world of work." With regard to the use of occupational information in the vocational choice process, Ginzberg argued that much of the information which was provided to individuals was too general to be of use in the decisionmaking process and that information about educational and employment opportunities in an area are not consistently available.

Hargrave, Benjamin. "The California Experience." Labor Market Information for Youths. Edited by Seymour Wolfbein. Philadelphia: Temple University, School of Business Administration, 1975.

Hargrave provides a brief overview of the California Manpower Management Information System. He discusses the background to the development of the system, its organization, and how the system developed as an interagency and intergovernmental effort. The article also contains a listing of the major data elements contained in the system.

Holden, Robert et al. Final Report on the Development of a Labor Market Information and Job Search Skills Development Program. Philadelphia: Universal Systems Development, 1978.

Project BEST (Better Employment through Skills Training) was an educational research/demonstration effort funded by the Employment and Training Administration. It was designed to offer a curriculum of labor market information and job search skills to disadvantaged minority youth in Philadelphia. The program was based on the premise that youth needed better occupational information and a variety of personal skills in

order to make more appropriate career choices and to develop attitudes more consonant with the world of work. The program was divided into five major components designed to provide the youth with the necessary skills and information: (1) introduction to the world of work information and skills acquisition, (2) presentation of labor market information, (3) training in job search skills, (4) group guidance and individual counseling, and (5) job placement. This document describes the rationale behind the overall program as well as the purpose of each component.

The authors identified three purposes in giving the youth labor market information: (1) to supply a knowledge of how the labor market operates in order to prepare youth to adapt to changes, (2) to give youth a better understanding of the career opportunities currently available to them, and (3) to give youth the ability to identify general and specific skills needed for career entry and progression.

The youth were given labor market information in the following areas: (1) career preparation, (2) career development, (3) labor force trends, (4) availability of jobs, (5) the hierarchy of jobs, (6) modes of entry into occupational paths, (7) local employment conditions, (8) projected future conditions in the local labor market.

Herr, Edwin and Cramer, Stanley. Career Guidance Through the Life Span: Systematic Approaches. Boston: Little, Brown and Company, 1979.

This is a comprehensive textbook of the theory and practice of career guidance. It provides a history of the development of the field and discussions of the major theories and techniques in career guidance. The use of occupational information is discussed and criteria for the development of an occupational information system are offered.

Hoppock, Robert. Occupational Information: Where to Get it and How to Use It in Career Education, Career Counseling, and Career Development. Fourth Edition. New York: McGraw Hill, 1976.

This textbook focuses on the use of occupational information in the career guidance process. It contains a recommended list of the kinds of information with which an individual should be provided.

Isaacson, Lee. Career Information in Counseling and Teaching. Boston: Allyn and Bacon, Inc., 1973.

This textbook focuses on the use of career information in the guidance process. A great deal of emphasis is placed on the counseling relationship itself. Theories of occupational choice are discussed in detail.

Kalackek, E. Longitudinal Labor Market Surveys: Asking 'How Come', Not 'How Many'. Monthly Labor Review, 101, (1978), 8-14.

In this article Kalachek argues that longitudinal surveys are the primary sources of data for learning about the effects of policy interventions on workers and the labor markets in which they work. To this end, he argues that the Current Population Survey is the most promising source of longitudinal data; gross flows, e.g. labor force entries and exits, can be calculated and tapes can be matched as well, in order to follow households through a 16-month period. Kalachek's article is directed primarily at the policy-oriented researcher, and he is not concerned with the use of the data by vocational or manpower planners. However, the data resulting from calculating gross flows could be highly useful to these user groups in terms of increasing the planners understanding of recent changes in their labor markets.

Lawrence, John E.S. and McAdams, Katherine. Vocational Development Theory and the National Longitudinal Study. Research Triangle Park, N.C.: Research Triangle Institute, 1978.

In this document Lawrence and McAdams review the major theories of vocational development. They identify three different categories of theories: accident theory, sociological and economic theories, and individual-centered theories. These theories are then discussed in terms of their application to analysis of National Longitudinal Study data. The authors conclude that a reorganization of the NLS conceptual framework toward vocational development concepts must be accomplished before such analyses can be undertaken most productively.

Lawson, Rodger. Perspectives on the Development of a Comprehensive Labor Market Information System for Michigan. Methods for Manpower Analysis No. 6. Kalamazoo: W.E. Upjohn Institute for Employment Research, 1973.

This report discusses the need for a comprehensive system of labor market information, the required data elements of such a system, and several research projects which were designed to develop and/or systematize data. Lawson establishes five criteria for including data in a labor market information system. The data should be: (1) reliable, (2) detailed, (3) timely, (4) structured, and (5) needed. On that basis Lawson recommends that the appropriate state agencies begin to work together to develop an occupational information system and that the system include the following categories of data elements: (1) current job opportunities, (2) job prospects information, (3) demographic and economic information, and (4) agency information.

LeCam, Christine. The Role of Institutional Supply Data in the Development of an Occupational Information System. Paper presented at the Seventh Annual New England Business and Economics Conference. Boston: Department of Manpower Development, Research and Program Development Division, 1979.

This article identifies the major sources of institutional supply data and identifies the strengths and weaknesses of these sources. The major sources of supply information are the Vocational Education Reporting and Accounting System (VEDS), the Higher Education General Information Survey, data from proprietary vocational education programs, data from apprenticeship programs (SNAPS), and data from CETA reporting. The chief use for these data sources in the context of an occupational information system is as the supply component in a model designed to match occupational supply and demand. The problems which exist in using these data sources for such a use are problems of 1) double-counting enrollees, 2) identifying occupational employment and training-relatedness of that employment for trainee follow-up and 3) accurately matching educational program codes to projected occupational openings with the current allocation methodology. To help alleviate these problems LeCam recommends research efforts be undertaken in these problem areas.

LeCam, Christine, and Sum, Andrew. A Description of the Methodologies and Data Sources Used in Constructing the Preliminary Occupational Demand-Supply Table for the State of Massachusetts. Boston: Research and Program Development, Department of Manpower Development, 1978.

The purpose of this paper is to describe how existing data sources can be used to calculate demand-supply match-ups. Demand-supply match-ups require the following data elements: (1) listing of all vocational programs currently offered in the state, (2) projected occupational employment, (3) the number of projected annual job openings, and (4) the outputs of all public and private vocational education programs. All data must be supplied in appropriate detail; in particular educational program outputs must be available in sufficient detail to translate to occupations. LeCam and Sum describe the current difficulties in relating educational and training programs to the occupations for which they are intended to train workers. For example, one can receive adequate training for an occupation in a variety of educational and training programs. The methods for handling this multiple crosswalk problem are reviewed. The authors conclude with recommendations for research aimed at improving the process of demand-supply match-up.

Lecht, Leonard. Evaluating Vocational Education-Policies and Plans for the 1970s. New York: Praeger, 1974.

This book contains a far ranging review and discussion of the rationale for the evaluation of vocational education programs and the policy issues which impact on these evaluations. Lecht identifies a variety of questions in which vocational education evaluations should attempt to address and the data elements necessary to address them. He views the intent of vocational education as that of preparing students with skills to enable them to acquire jobs. Lecht attributes the "loose relationship between vocational education enrollments and prospective career opportunities to the inaccessibility of data on projected supply and demand" and the low importance which students and local educational agencies place on the use of this data.

Lecht, Leonard. Occupational Choice and Training Needs: Prospects for the 1980s. New York: Praeger, 1977.

In this book, Lecht discusses major issues involved in planning education and training programs. He points out the wide impact which occupational choice has on both the individual and the economy. Similarly, he discusses the variety of factors, in addition to projected job openings, which must be taken into account in the planning of vocational programs.

Lecht, Leonard A. Occupational Projections for National, State, and Local Areas. National Commission on Employment and Unemployment Statistics, Background Paper No. 20. Washington, D.C.: U.S. Government Printing Office, 1978.

The Lecht article provides a detailed anatomy of labor force projections. The author describes the sources of occupational projections, how these projections are derived, and the assumptions necessary in their calculation. Demand projections are more common than supply projections, with programs at the Bureau of Labor Statistics being the major source of both types of projections. Lecht attributed the recent growth in the number and detail of occupational projections to national policy needs, exemplified by education and employment and training legislation mandating increased opportunities for disadvantaged groups. Although the purpose of the projections is to help facilitate the training of individuals for jobs in which there will be future vacancies, research suggests that the projections are included in state vocational education and CETA plans without being used in decisions regarding appropriate training options. Lecht also expressed hesitancy about relying heavily on the projections in making these decisions. Research indicates that the projections are more reliable on an economy-wide rather than a state or local basis and that the projections have merit at predicting growth in broadly defined occupational fields but are of limited utility in predicting growth in detailed occupations. Lecht recommended six actions be undertaken to improve the usefulness of occupational projections: (1) program planning systems based on highly detailed subnational projections should be reconsidered because of the tentative nature of the data, (2) more accurate and comprehensive information about current output of different occupational

training systems should be undertaken as a first step in improving occupational supply projections, (3) more research on educational and career choices as well as occupational mobility is needed to make better use of current projections, (4) job openings resulting from large federal procurement contracts should be projected at the local level, (5) projections estimating the proportion of individuals with specific demographic characteristics should be developed, and (6) exploratory research to improve projection techniques should continue.

Levine, Louis. Labor Market Information for the Local Delivery of Manpower Services. Report prepared for the U.S. Department of Labor, Manpower Administration, 1972.

This study focuses on the information needed by intermediaries to provide manpower services to individual clients. Levine argues that one cannot consider manpower operating requirements and their effect on labor market information needs without considering the labor market information needs of the manpower agency's clients. In addition, he argues that the content, structure, and organization of local labor market information should be shaped by client-service requirements. Finally, Levine identifies major data elements, their organization, and the use of the data elements in the service delivery process.

McKinlay, B. Developing a Career Information System. Eugene, Oregon: University of Oregon, Career Information System, 1974.

This document contains a detailed discussion of the format and delivery technology of the Career Information System. It contains little discussion of the theoretical need for occupational information or of the demonstrated usefulness of it.

McKinlay, B. and Franklin, P. Education Components for a Career Information System. Eugene Oregon: University of Oregon, Career Information System, 1975.

McKinlay identifies the objective of the Oregon Career Information System (CIS) as determining "what is required by way of information

development activities to translate basic labor market data to information that is intelligible to individuals." The body of the article discusses the organizational management and finances of the CIS rather than the occupational information which is stored in it.

McKinlay, Bruce, et. al. Education Components for a Career Information Information System. Eugene, Oregon: University of Oregon, Career Information System, 1975.

This study is an evaluation of a project to expand the Career Information System (CIS) to include information on post-secondary educational opportunities in Oregon. The two major objectives of the project were to: 1) "enhance the post-secondary educational consumer's decision-making capacity by improving the quality and usefulness of information," and 2) "enhance the capabilities of CIS and other agencies to collect and disseminate high quality educational information to consumers."

Several problems with data sources were outlined. Among those mentioned were that federal and state data sources on post-secondary institutions did not necessarily contain data adequate for planning or consumer purposes. College directories, while providing some useful data, do not compare institutions along dimensions most useful to consumers. Neither do they provide data on other than two and four year colleges. School catalogues are not always accurate and complete.

Mangum, Garth L. Employment and Unemployment Statistics and the CETA Prime Sponsor. National Commission on Employment and Unemployment Statistics, Background Paper No. 7. Washington, D.C.: U.S. Government Printing Office, 1978.

This article is based on a two day conference with leading prime sponsor planning directors. The conference was designed to find out the labor market data which CETA planners require and the planners' satisfaction with data which is currently available to them. The CETA directors identified four separate, and sometimes conflicting, uses for planning data: (1) to determine the amount of federal money allocated to them, (2) to meet federal reporting requirements, (3) to defend internal resource allocation decisions to local interest groups, and (4) for planning purposes. Both supply and demand data is required to meet

these four needs. Mangum carefully describes the supply and demand data needs expressed by the CETA directors and the data which was currently available to meet these needs. The weaknesses of these data sources is also described. The following recommendations were made to improve the appropriateness of available data: (1) diversify the political pressure on allocation formula by broadening the range of factors considered, (2) revise the sampling design for the Current Population Survey so that prime sponsor jurisdictions become the Primary Sampling Units, (3) derive an industry occupational matrix which combines the 3-digit SIC code with the 6-digit DOT code, and (4) develop the survey methodology and monitor the quality of data at the national level to ensure that the data will be of use at the prime sponsor level.

Moore, G. Improving the Presentation of Employment and Unemployment Statistics. National Commission on Employment and Unemployment Statistics, Background Paper No. 22. Washington, D.C.: U.S. Government Printing Office, 1978.

This article contains a variety of recommendations for the development of additional employment and unemployment statistics and for improving the presentation of statistics which are currently available. The use to which these new statistics would be put is not discussed, although the recommendations would appear to benefit individuals making policy decisions most strongly.

Regarding the improvement in the presentation of employment and unemployment statistics, Moore made five major recommendations. First, he argued that the base for the employment and unemployment rates should be changed. A two-fold purpose would be served if the base was changed from the number of individuals in the labor force to the number of individuals in the population who are working age. This statistic would be more accessible to the general public. Second, the change would allow one to trace the expansion and contraction of the labor force with the changing business cycle. In addition, Moore recommended that the Bureau of Labor Statistics publish a variety of statistics which allow one to follow the economy through the business cycle. Third, he recommended that job vacancy statistics be published on a monthly basis. Fourth, he suggested that an independent agency perform a continual audit of employment statistics

to help maximize the utility of these statistics for policymakers. Finally, Moore recommended that the Bureau of Labor Statistics publish a monthly chartbook and yearly compendium of employment and unemployment statistics. His suggested title for this chartbook is Employment Conditions Digest. Of particular relevance to an occupational information system, Moore indicates the categories of data which he feels should be included in an Employment Conditions Digest. These seven categories of data are: (1) employment, (2) unemployment, (3) hours of work, (4) persons not in the labor force, (5) leading, coincident, and lagging indicators of employment conditions, (6) comparisons of economic recovery and expansion with past business cycles, and (7) international employment comparisons.

National Commission on Employment and Unemployment Statistics. Counting the Labor Force. Washington, D.C.: U.S. Government Printing Office, 1979.

This is the major policy document of the National Commission on Employment and Unemployment Statistics. In 1976 the Commission was mandated to thoroughly review and assess the nation's employment and unemployment statistics. The Commission was also requested to review the adequacy of existing information on current and projected employment by occupation, to review data on enrollments and completions from public and private educational institutions, and to determine the need for additional labor market data. This document reports the Commission's major findings and recommendations.

National Occupational Information Coordinating Committee. A Framework for Developing an Occupation Information System. Washington, D.C.: National Occupational Information Coordinating Committee, 1979.

This is the major policy document of the National Occupational Information Coordinating Committee (NOICC). The document contains chapters on an overview of the concept of an occupational information system (OIS); the structure of an OIS, including recommendations for data elements to be included; delivery of an OIS; SOICC's operational alternatives for developing an OIS; and recommendations for a strategy for SOICC directors.

New England Regional Commission. Occupational Training Information in New England: An Evaluation. Volumes 1 and 2. Report to the U.S. Department of Labor, Bureau of Labor Statistics. Boston: New England Regional Commission, 1978.

This document covers a wide range of topics. After a discussion of the conceptual framework of occupational demand and occupational supply, the state of the art of occupational demand and supply information is discussed. A brief section on the development of a national policy toward occupational information is also included. The body of the document is devoted to the identification of occupational training programs below the BA level in the New England region and to the evaluation of information which is available on program participants.

Norris, Willa, et al. The Information Service in Guidance: For Career Development and Planning. Third Edition. Chicago: Rand McNally and Co., 1972.

In this textbook, Norris, et al argue that individuals making decisions about career choice need information in the following general categories: occupational information, educational information, and social information. They also provide a detailed list of occupational information about which they feel individuals should know. However, the book focuses on the function and delivery of information in the guidance process rather than on the actual information which is needed.

Parnes, Herbert. "Improved Job Information: Its Impact on Long-Run Labor Market Experience." Labor Market Information for Youth. Edited by Seymour Wolfbein. Philadelphia: Temple University School of Business Administration, 1975.

This article deals with the need for job information and the consequences of improved knowledge of the world of work. Parnes notes that youth of all ages have inadequate occupational information. He argues that improved occupational information can lead to more efficient allocation of resources, to increased social benefits, and to more satisfying careers for individuals. In particular, Parnes asserts, "adequate information is obviously not a sufficient condition for equality of opportunity, but it is a necessary one."

Parnes, H. and Kohen, A. "Occupational Information and Labor Market Status: The Case of Young Men." Journal of Human Resources, 10, (1975), 44-55.

The research on which this article is based examined the correlates of the extent of labor market information among a representative national sample of young men aged 14 to 24 and examines the relation between the extent of labor market information and the labor market status of the youth two years later. Parnes and Kohen found that a score on the occupational information test was positively related to education, measured intelligence, family's socioeconomic status, and residence in a large city. No significant relationship was found between the number of counselors per capita in the youth's high school and the youth's score on the occupational information. The extent of the youth's occupational information was found to be a positive influence on their occupational status and hourly earnings two years later. The authors draw four policy conclusions from these results. First, from the standpoint of human capital theory, the results offer support to the notion of a "payoff" to labor market information. Second, the relationships among educational attainment, extent of occupational information, and hourly earnings suggest that education may contribute directly to an individual's earnings and may contribute indirectly as well through the youth's increased labor market skills. Third, based on the lack of relationship between intensity of counseling and extent of occupational information the authors suggested that vocational counseling may not be filling one of the roles assigned to it. And, fourth, the strong relationship between socioeconomic status and extent of labor market information leads the authors to suggest that schools should concentrate on relaying labor market information to youth of lower socioeconomic status.

Pearce, Charles A. Occupational Components of Labor Market Information in State Employment Security Agencies. Labor Research Report No. 23. New York: New York State Department of Labor, Division of Research and Statistics, 1975.

In this paper Pearce discusses the major functions of State Employment Security Agencies and the major sources of data collected by employment security agencies.

Rodgers, Ronald. Educational Planning in the Labor Market: Linking Occupational Education to Regional Economic Development. Evanston, Ill.: Northwestern University, Graduate School of Management and School of Education, 1976.

The purpose of this study was to examine the practice of vocational educational planning in a labor market area in Illinois. The author argues that the absence of information about the availability of people or the wage needed to attract the needed labor may operate as barriers to the economic development of a region. In the body of the report Rodgers discusses how a variety of specific occupational information data elements are dealt with in the educational planning process.

Shea, John. "Occupational Education and Training Requirements: Relationships Essential for Planning State Vocational Education." Manpower Information for Vocational Education Planning. Edited by Robert C. Young. Columbus, Ohio: Center for Vocational and Technical Education, Ohio State University, 1969.

This paper raises a variety of theoretical issues which impinge on the use of manpower information in vocational education planning. Shea argues that the initial step in developing manpower information for vocational education planning is to determine what decisions would be made differently if information was available. With this in mind, Shea lists the following information as necessary in making wise educational planning decisions: 1) the interests, aptitudes, aspirations, and abilities of students and trainees, 2) performance requirements in various occupations, 3) employer hiring standards, 4) occupational entry barriers, and 5) other existing sources of labor supply.

Smith, Ralph E. and Vanski, Jean E. Gross Change Data: The Neglected Data Base. National Commission on Employment and Unemployment Statistics, Background Paper No. 11. Washington, D.C.: U.S. Government Printing Office, 1978.

Gross change data provide estimates of the total number of people who move between labor force categories from one month to the next. These data highlight the dynamic behavior underlying changes in labor force size which are hidden in the net change data. In their article Smith and Vanski discuss the research uses of gross change data, as well as the statistical problems in the data which resulted in the termina-

tion of its publication. The authors also discuss research techniques which have been used to improve the reliability of the data and conclude that an incremental strategy be adopted for improving and disseminating the data.

Sommers, Dixie. "Occupational Supply Information and Planning for Education and Training." Paper presented at the North American Conference on Labor Statistics, Ottowa, Canada. July 26, 1976.

Although adequate estimates of present and future labor demand are available, the complementary supply data is lacking. Sommers attributes this data inadequacy to the complex source of occupational supply: (1) training related to the occupation, (2) training not related to the occupation, (3) occupational transfers, (4) labor force entry or re-entry, and (5) in-migration. Unlike occupational demand, occupational supply has not been modeled because of the absence of a comprehensive data base and the nature of the job entry process. Sommers suggests that it will be unlikely if the Bureau of Labor Statistics will develop a comprehensive supply data system in the foreseeable future, although efforts should be made to identify occupations where supply information is most important and to improve the existing data base. She recommends that: (1) training and followup information be improved, (2) the measurement of separation rates be re-examined, (3) methods be developed for integrating existing information on occupational mobility and migration into present system for estimating job openings, and (4) data be made more accessible to its users.

Stern, Barry. "Application of Information Systems to Career and Job Choice." Labor Market Information for Youths. Edited by Seymour Wolfbein. Philadelphia: Temple University, School of Business Administration, 1975, p. 199-234.

In this article Stern discusses the three major components of the Oregon Career Information System: informational development, information delivery, and organizational structure. He argues that different kinds of occupational information are needed for educational and manpower planning, for career choice, and for job choice. However, he argues that a comprehensive occupational information system can serve all three func-

tions. Finally, Stern provides a useful chart on the information development attributes of leading career guidance and information systems.

Stevens, David. "Employment Projections for Planning Vocational Technical Education Curricula: Mission Impossible." Unpublished paper. University of Missouri-Columbia, Human Resources Research Program, 1976.

Stevens discusses nine employment projections models and three employment projections methods. His discussion of the strengths and weaknesses of these approaches is excellent. He concludes with a discussion of how labor market concepts can be used in educational planning.

Stevens, David W. An Experimental Labor Market Information Program to Encourage Self-Initiated Job Search by Selected Registrants With Public Employment Service Offices. Washington, D.C.: U.S. Department of Labor, Manpower Administration, 1972.

In this field experiment, an experimental group of individuals were given information about employers with potential job openings. The control group was given no referral information of this type. The results of the experiment were inconclusive. Nonwhite recipients who received information were significantly more successful than the control group nonwhites in finding acceptable employment. However, this result is not directly explicable to the receipt of supplementary information, because only one experimental group nonwhite accepted a job with one of the employers to which he had been referred.

Stevenson, Wayne. "Transition from School to Work." The Lingering Crisis of Youth Unemployment. Edited by Arvil Adams and Garth Mangum. Kalamazoo: W.E. Upjohn Institute for Employment Research, 1978.

A variety of issues related to the transition from school to work are discussed in this article. Using National Longitudinal Survey data, Stevenson presented findings that a measure of labor market knowledge is positively correlated with early labor market success. Among 16 to 19 year-old females labor market knowledge was positively correlated with the probability of labor force participation and negatively correlated with probability of unemployment. However, these relationships did not emerge among the sample of 16 to 19 year-old males. Finally,

labor market knowledge was positively correlated with the wage and salary income of black and white teenagers of both sexes.

Strickland, Norma. "Labor Market Data for Vocational Education Program Planning." Florida Vocational Journal (January-February, 1977), p. 14-19.

In this brief article Strickland describes the organization of the Florida employment security system and the major ES data programs that are available.

Sum, Andrew and Harrison, Bennett. "Labor Market Information Data Requirements from the Perspective of 'Dual' or 'Segmented' Labor Market Research." Boston: Department of Manpower, May 1978.

The purpose of this report was to ascertain the extent to which further development of labor market segmentation theory depends upon information from variables which the present national system of labor market data does not adequately provide. After describing seven testable hypotheses derived from labor market segmentation theory, the authors indicate four types of labor market data which would be needed to test these hypotheses: (1) data on the characteristics of operationally defined primary and secondary jobs, (2) data on the economic characteristics of establishments, (3) data on the characteristics of job holders, and (4) data on the job and occupational mobility of workers. These data could be used to investigate whether employment and training and job creation policies are moving workers into better jobs.

Ten major national surveys are examined to determine the extent to which the required data is collected in their context. The authors conclude that from the needs of labor market segmentation theory the current surveys have conceptual weaknesses or limited data coverage, particularly on characteristics of establishments and reliable state and local data. It is recommended that: (1) the Current Population Survey and its March supplement be expanded, (2) future national Census collect needed data, (3) establishment and household survey data be integrated at the national level, and (4) new longitudinal labor force surveys designed to collected needed data be undertaken.

Sum, Andrew, Sawhney, Pawan, Herrnstadt, Irwin. Issues in the Development of a Comprehensive Occupational Information System for the Commonwealth of Massachusetts." Boston: Department of Manpower Development, Research and Program Development Division, 1977.

This is a wide-ranging article which covers a variety of topics. The authors first present recommendations for the key data elements of a comprehensive occupational information system. The bulk of the article is devoted to a discussion of available supply and demand data, the weaknesses of the data, and strategies for matching supply and demand figures to estimate occupational shortages. The labor supply study conducted through Northeastern University for the Massachusetts Employment Security agency was summarized. The results of this survey provided a variety of data elements for a recommended occupational information system, particularly in the area of complementary information. The article concludes with a set of recommendations for a future research agenda to guide the development of a statewide comprehensive occupational information system. The nine recommendations are:

(1) The findings of the O.E.S. program should be combined with data from ES-202 and BLS-790 industry surveys to produce current estimates of occupational employment.

(2) A systematic review of the methods currently used by the Division of Employment Security to project state and local industry employment should be undertaken.

(3) Future occupational projections for the state should be based on industry/occupation matrices incorporating existing data from the O.E.S. surveys.

(4) Continued research into improving the quality of the estimates of age-sex specific separation rates should be supported.

(5) Current Office of Education reporting forms should be revised to improve both the quality and quantity of enrollment completion, and placement data.

(6) Continuous statewide surveys of enrollments in and outputs from occupational programs administered by the proprietary training schools should be undertaken.

(7) Continuous, comprehensive surveys of the training activities of CETA prime sponsors should be supported by the SOICC.

(8) Further research into the development of specific allocation methods for handling the multiple occupational crosswalk should be supported.

(9) Findings from occupational employment surveys should be continuously supplemented by analyses of occupational labor market structures and their actual modes of operation at the state and local level.

Sum, Andrew, Sawhney, Pawan, Mazzeo, Katherine. "An Introduction to the Role of Occupational Information Systems; The Objectives of the Labor Supply Study." Boston: Department of Manpower Development, Research and Program Development Division, 1978.

This article is the first chapter of a larger report analyzing the sources of labor supply to high demand occupations in the Boston SMSA. It provides a discussion of the background, purposes, and uses of an occupational information system for manpower planning. Two purposes for an occupational information system are identified: (1) to provide "a set of inputs into decisionmaking processes of both private individuals and public and private officials who are responsible for administering and operating employment-related educational and training programs, and (2) to improve the effectiveness of the manpower planning process by linking private and public educational investments to present and future manpower requirements. The authors further identified six key components on an occupational information system: (1) estimates of current levels of employment by occupation, (2) projected levels of employment, (3) projected annual job openings, (4) a variety of information on major industrial employers, (5) estimates of annual additions to labor supply by occupation, and (6) comparison of annual projected openings with estimates of annual additions supplied from educational institutions.

Super, D. and Hall, D. "Career Development: Exploration and Planning." Annual Review of Psychology. 1978, 29, 333-372.

This is a lengthy review of research literature dealing with all aspects of career development. The role of information in occupational selection is discussed in only a very small section. Four pieces of literature are cited which conclude that realistic occupational information has a positive effect on job commitment, when this is measured in terms of remaining on job.

Teeple, John. An Analysis of Manpower Requirements Information and the Availability of Vocational Education in Selected Urban and Rural Areas. Washington, D.C.: National Planning Association, 1971.

The purpose of this study was to evaluate the use of information in vocational education planning, particularly in curriculum decisionmaking. Based on data gathered in six local education agencies, the authors conclude that quantitative data played little role in the decisionmaking process. Detailed manpower and demographic information was seldom used in the local planning efforts, only one site was preparing a plan which linked educational planning to specific quantitative objectives, and little information was available about the vocational education students themselves. In an effort to facilitate the use of data in vocational education curriculum decisionmaking, the authors recommended that a planning of planning materials be provided to local education agencies by state departments of vocational education. This package should contain annual job openings for current year, projected year, and five years into the future, by OE program codes. The package should also contain current and projected populations of secondary and post-secondary school age youth by age, sex, race, and handicap. The authors also recommended that the local education agencies be required to collect the following items: 1) vocational program enrollment for the current year, 2) program completions for the most recent year, and 3) placement followup data. The three data items should be tabulated by age, sex, race, handicap, and OE program codes.

Thal-Larsen, Margaret with Stephen Laner and Donald Mayall. Requirements and Design of a Labor Market Information System for a Large Metropolitan Area. Berkeley: University of California, Human Factors in Technology Research Group, 1972.

This major work is a detailed outline of the requirements and design of a labor market information system in the Bay Area in California. Thal-Larsen surveyed the major user groups of labor market information. She questioned them about their data needs and the uses to which they would put the data if it were available. Thal-Larsen divided the data needs into four major categories: current job opportunities information, job prospects information, demographic and economic information, and agency information. Twenty-eight data elements were identified as needed, and the sources, structure, and use of these data elements are described in detail.

Tweeten, Luther. Rural Employment and Unemployment Statistics. National Commission on Employment and Unemployment Statistics, Background Paper No. 4, Washington, D.C.: U.S. Government Printing Office, 1978.

Tweeten argues that rural areas have many unique characteristics which pose special problems for labor force data systems. The most important of these problems are high incidences of self-employed, unpaid family, and seasonal and migratory workers. There is also a high incidence of multiple job holding, and a low incidence of participation in or knowledge about social insurance programs. Existing data sources are inadequate for measuring these unique characteristics. Tweeten discusses the currently available sources of rural labor force data and the major weaknesses of the most important of these sources. Four severe data problems exist: data is not available with adequate geographic detail, the classification system for agricultural labor is inadequate, the data on hired farm labor is of uneven quality, and the unemployment rate statistic in rural areas grossly underrepresents the underutilization of human resources. This problem is of particular importance, because of the pivotal position of the unemployment rate in determining the amount of federal dollars the area is entitled to receive.

Four major recommendations are presented: (1) an underemployment index be constructed for use in federal allocation formulas and other public policy uses, (2) the sample size of the Current Population Survey and Statistical Reporting Service be expanded to improve state and local level estimates, (3) the existing farm labor force data systems be studied with a view toward combining some services, (4) linkages be improved between household and establishment data.

U.S. Department of Labor, Bureau of Labor Statistics. Occupational Employment Statistics Handbook. Washington, D.C.: U.S. Government Printing Office, April 1979.

This document describes the Occupational Employment Statistics Program of the U.S. Department of Labor. The Program is a federal/state program consisting of three parts: (1) a periodic mail survey administered in three year cycles designed to provide current estimates of industry staffing patterns in the nonfarm wage and salary sector, (2) the national/state industry-occupation matrix system which expresses industry staffing patterns in terms of ratios of employment in each occupation in a given industry, and (3) state and area occupational projection program which provides for the development and improvement of projection methods. The handbook discusses each of the three parts of the OES system, describes methods to perform necessary matrix and projection calculations, and discusses problems involved in each of the three OES survey steps.

U.S. Department of Labor, Bureau of Labor Statistics. Occupational Supply: Concepts and Sources of Data for Manpower Analysis, Bureau of Labor Statistics Bulletin 1816, Washington, D.C.: U.S. Government Printing Office, 1974.

In this document a structural model of occupational supply is presented. The sources of occupational supply are discussed in detail. A functional model of occupational supply is also described and the uses to which this data can be put is described briefly. The article concludes with an excellent discussion of the major sources of supply data.

U.S. Department of Labor, Manpower Administration. Manpower Program Planning Guide. Washington, D.C.: U.S. Government Printing Office, 1974.

This book is a simple guide to prime sponsors describing how to get started on CETA planning. The book is divided into three major sections describing: 1) how to establish the legislated organizational structure for planning, 2) the necessary steps in a strategic planning process, and 3) the necessary steps in operational planning or program management. Six steps are identified in the strategic planning process: 1) define program purpose, 2) develop area analyses, 3) define needs, 4) establish priorities, 5) inventory and assess current programming effort, and 6) establish goals.

The development of area analyses requires data on population characteristics, labor market conditions, and community services. The data elements necessary for each of these analyses are described. Twelve major pieces of data which are necessary for assessing the population characteristics and the labor market conditions within a prime sponsor jurisdiction are identified: 1) population count by age, sex, and ethnicity, 2) the number of labor force participants by age, sex, and ethnicity, 3) unemployment by age, sex, and ethnicity, 4) educational attainment by the population by age, sex, and ethnicity, 5) the income levels and income sources of families by age, sex and ethnicity, 6) occupational employment by age, sex, and ethnicity, 7) the number of families receiving welfare, 8) employment projection by industry, 9) the geographic distribution of employment and unemployment, 10) current occupational employment, 11) occupational skill requirements, and 12) wage levels by occupations. A series of questions which these data should be used to answer and the sources of the data are also provided.

Weick, Jerry. Occupational Information for ES (Employment Service) Counseling: An Evaluation of Occupational Information Access Pilot Usage in Three Portland Employment Division Offices, Eugene: University of Oregon, 1972.

The purpose of this study was to evaluate the effectiveness of occupational information in counseling in employment security offices. Weick

reported that the counselors felt that the Occupational Information Access System had an influence on the clients' decisionmaking. Weick concluded that the use of OIAS enriched the occupational decisionmaking process by stimulating exploratory activity and by introducing more order into the decisionmaking and counseling process.

Wolfbein, Seymour. Establishment Reporting in the United States. National Commission on Employment and Unemployment Statistics, Background Paper No. 2, Washington, D.C.: U.S. Government Printing Office, 1978.

This report deals with four major aspects of the system of establishment reporting. These areas are: (1) the major conceptual and technical aspects of the BLS system, (2) a comparison of similarities and discrepancies between BLS establishment data and the Current Population Survey, (3) the need for more hours and earnings data, and (4) data available on the agricultural sector. Wolfbein discusses in detail the BLS data collection process and makes a series of recommendations for improving the management of data collection, the quality of the data collected, and the use of the data. He also recommended additions to currently available data, including greater geographic disaggregation (in urban areas), place of work and place of residence, earnings and hours worked for all employees.

Wool, Harold. The Adequacy of Occupational Data on Employed and Unemployed Workers for Anaylyzing Labor Market Behavior. National Commission on Employment and Unemployment Statistics, Background Paper No. 18. Washington, D.C.: U.S. Government Printing Office, 1979.

In this report Wool identifies the five major uses of occupational data, the five major sources of occupational data, and the limitations of these sources in view of the policy tasks for which the data is required. On the basis of these limitations he made four primary recommendations. First, an alternative approach to defining the occupational attachment of workers, based on the type of work sought by jobseekers rather than last job, could be developed for use in the Current Population Survey. Second, in order to meet the demand for current and more detailed data on unemployment by occupation at the state and local levels, the data being produced through the expanded CPS sample should be supplemented by a modification and expansion of the current program for collection of

occupational data on unemployment insurance claimants. Third, the CPS occupational mobility surveys should be scheduled on a regular basis and should be modified to provide more occupational detail. Fourth, all federal statistical agencies producing occupational statistics should be required to establish firm schedules for revising or adapting their occupational classifications to conform to the S.O.C. manual subject to specified conditions.

Yavitz, Boris, Morse, Dean with Dutka, Anna. The Labor Market: An Information System. New York: Praeger, 1973.

In this book the authors develop a detailed conceptual structure of the labor market. This is background to a discussion of the need for labor market information among a variety of user groups. Although the book does not contain a systematic discussion of the data needs of user groups, the kinds of activities for which data are needed are discussed. Individual chapters are devoted to the following user groups: employers, guidance personnel, vocational education planners, and federal government policymakers. The final chapter contains a series of broad recommendations for future directions in the development of an occupational information system.

Young, Kathleen. An Assessment of the Decisionmaking Data Needs of State Economic Development and Planning Officials. Washington, D.C.: National Governor's Association Center for Policy Research, 1979.

This report is based on a survey of economic development planning officials in 50 states. Respondents were asked to rate their need for 62 specific data elements. They were also asked to cite their data needs which were not being met at the time of the survey. Of the existing data elements, state officials reported that income and employment data was the most valuable to them. When asked for new data requests, respondents gave the highest priority to data on foreign investments, population migration, income distribution, and underemployment.